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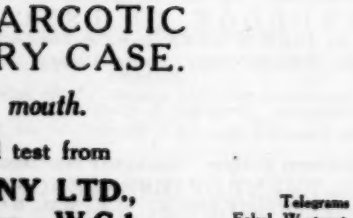

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THE discussion [1] held on Dec. 7th last under the auspices of the Fellowship of Medicine, on the subject of excessive operations on the tonsils, shows how strong a feeling there is among an important group of our profession; and the figures brought forward by Dr. J. A. Glover show how grave a situation has arisen by the continued increase at the rate of 2 per cent. per annum of tonsillectomised children, both in our private and in our council schools. But a debate like this does nothing to diminish the incidence of operation unless subsequent action can be taken upon it.

As one who long ago [2] raised his voice against the increase that was occurring even then, I would submit certain principles that I may classify under three groups. The first are clinical, the second administrative, the third group includes some of the influences which seem to me to weigh in favour of these excessive operations.

Clinical

1. First let us note the Hippocratic maxim that in any course of treatment we must not only consider whether it will do any good but whether it can possibly do any harm. Lord Dawson, at the meeting, accurately described with the eye of an accurate observer changes in the palate that impair its efficiency and that may result from an "operation of perfection." No one can ever guarantee that this will not occur. If this were the only evil result we might discount it against quite small advantages. But the operation for the removal of tonsils has a greater number of complications to life, as to immediate illnesses, and to post-operative impairment of function, than any other operation of the same magnitude. So long is the list, that if it were read over at the time of consultation any parent would hesitate to consent to the operation being performed. To say that it is devoid of risk cannot by any reasonable criterion be considered an accurate statement.

2. Next, the operation is never "absolutely necessary." Strictly speaking, this phrase is unsuitable for the type of surgery to which tonsillectomy belongs. It should be limited to the surgery of disorders in which death is reasonably certain if there is not performed an operation that gives a good chance of recovery. Even in a wider sense it is too strong a term to use for this operation. There is no case of rheumatism, nephritis, or other disease in which the tonsillectomy has not been done and in which we can say with confidence that the disease would not have occurred, or would not have progressed, had the operation been performed at some time previously. Further, the operation of tonsillectomy is of such recent origin that those who may still look forward to a quarter of a century of active life are too old to have had it performed in childhood; yet there is no evidence as yet to show that the subsequent generations who have grown up in the age of tonsillectomy are fitter than that which experienced the Great War. The most that we can say is that the operation is advisable, perhaps strongly advisable; but never absolutely necessary.

3. Again, it is but seldom that one can say the tonsils are "obviously diseased." If one does, and if for some reason the operation is deferred, it is likely that it will be found that no harm has come to the patient from their presence. It is probable that there is no operation in surgery upon which a decision is more rapidly made in practice, nor one in which it is more necessary to weigh the pros and cons, not only of the local conditions, but also of the general health, of the habit of mind and of body, and of the hygienic conditions of school, home, and place of occupation.

With these three principles in mind two usual indications should be swept away.

4. The phrase, an "enlarged" tonsil, should be removed from our terminology. The tonsils, for the enlargement of which the operation of tonsillotomy was devised, are not seen to-day, yet succeeding generations of students read and hear about "enlarged" tonsils as an indication for their removal, without any criterion as to the size which warrants it. We do not to-day remove a tonsil because it is enlarged. We remove it, whatever its size, because we believe that there are residing within it micro-organisms that are harmful to the individual.

5. And so the conception of the "typical adenoid faces" should be dropped.

Clinical observation must always remain our sheet anchor in clinical medicine; and yet it may be wrong. The uncritical acceptance of it by all must always be suspect, and that is what has happened with this. Purely an English conception, it has been accepted neither on the continent nor in America; there has never been any other evidence to support it. Sir Arthur Keith went into it and doubted its association with nasal obstruction; the dental surgeons have for years been studying it and found that what they have been taught by the laryngologists is wrong. And finally Mr. Somerville Hastings gave it a death-blow, and yet the idea will not lie down.

If all who decided upon an operation on the grounds of either or both of these two indications were to defer it unless and until they could find other indications without using these two a great improvement would be made.

6. Finally as to function. There are those who say we know not the function of the tonsil, they call it vestigial, and demand of us that we should prove its function. But we know its function from its structure. It is a lymph-gland differing only from the other lymph-glands by its anatomical relationships. If we know not its function we do not know the function of other lymph-glands. The principles which govern the surgery of these apply also to the tonsil.

Administrative

1. The condition for which we advise operation is not a clinical entity. Therefore decision should not be made at the first examination. The consultant may have to do so when he has the evidence of the practitioner. Even then there may be doubt, and if there is, it is better to defer operation than to decide at once. Delay up to six months or even more is never harmful.

[1] THE LANCET, 1933, ii., 1394.

[2] Tonsils and Adenoids in Children: A Plea for Fewer Operations. Trans. Med. Soc. London, 1914, xxxvii., 244.

But in the vast majority of cases the evidence of a practitioner is not before one, or is incomplete and inconclusive. This applies to nearly all out-patient and school clinic work. It is well never to come to a decision at the first attendance and often three or four are advisable.

2. Haste is the enemy of all good work. It is to be feared that the operation of tonsillectomy is often advised in too short a time. It takes longer to decide against an operation than hastily to advise one. In the hurry of a busy out-patient department with rows of patients still to be seen and an appointment to be kept at a stated time it is difficult not to hasten. And yet is it right to ask the parent to confide a child's life into your hands without at least ten minutes' consideration, with another five minutes to explain the matter to the parent? All clinics should be organised so that a minimum of a quarter of an hour is devoted to each individual, though all of this time need not be that of the head of the clinic.

3. Another great cause of ill-considered decisions is the written consent for operation. It can be carried out by a lay clerk and save the time of the doctor; but this should not be. The parents have a right to be given reasons for the advice and to have the opportunity of asking any questions that they may wish. I will not allow these written consents in my department; and demand that each case should be explained, not in such a way that the medical man thinks he has put it clearly, but in such a way that he knows the parent has understood it clearly. One is sometimes told that the intelligence of the parents does not admit this method. Yet I find that is seldom so to-day; and if parents have not had the advantages that we have had they should the more be entitled to our time in explanation. Often, however, this accusation of want of intelligence on the part of parents is the cloak of an inability to explain on the part of the doctor; and the best way to remedy this is by practice.

If these three rules be carried out I believe that a large number of operations would be avoided. It is necessary therefore so to organise our clinics that adequate time can be given to each case. In a paid clinic this is not difficult. The authorities have but to summon cases enough to occupy the average time of the session, which is usually approximately two and a half hours. It should be easy to deal with the medical man who habitually finishes before time. If he is a quick worker more cases may be summoned, but if he skimps his work it should be insisted that he remains on the premises for the full period.

In voluntary hospitals it is more difficult. Most depend for their financial support upon the number of persons they can attract to their out-patient departments; the number that comes daily is subject to fluctuation; on one day there may be hardly enough to do, on another, if the chief of the clinic were to attend to every case personally, ten hours' work would not be enough to do justice to all. To a great extent this variation must be inevitable, and must be neutralised by a delegation of the chief's duties to assistants who need have had no special experience so long as they are given guidance and the chief retains the final decision as to operation.

But while it may be necessary for an institution to make the total number of attendances a ground for claims upon the charitable public, the number of operations performed should never be so made. They may all have been necessary, but so soon as a competition is introduced the number is certain slowly though steadily to rise.

Two other rules of a clinical administrative nature may be enunciated:

4. The first is that operations upon the tonsils should not be performed in the winter months. The best periods of the year for their performance are the spring and autumn, and in a fine year such as the last has been they may be continued nearly up to Christmastime,[3] but once that is passed they are best deferred until the spring, when the milder, finer weather has begun to come again. This is specially advisable in a year of epidemics. I look upon measles as the most serious complication of these tonsillectomies. So highly infectious is it, and so long is the incubation period, that it is impossible to set up any organisation for the continuance of tonsil operations during the prevalence of measles without the risk of a case being operated on during the incubation period so that the disease supervenes upon an unhealed throat. Once one has realised that the operation is not urgent it is easy to shut down all operations during this period; and on no account to do one in a child that has not had measles. This practice will solve the anxiety of sending the patients home in the winter after operation which, it must be recognised, is not solved by admission to clinic or hospital for three nights unless an ambulance is provided to take them home afterwards.

5. The second is not to operate on the patient living in unhygienic surroundings.

Tonsillectomy is bad for the children of the very poor. There are those who recognise that the squalor in which the child lives and the want of nourishment to which it is subjected are the primary causes of ill-health, but who think that some sepsis in the tonsils is also present; and feel that though they cannot prescribe the proper treatment of a new dwelling and a full stomach they must do a second best by removing the tonsils. The argument is fallacious, for under these circumstances the operation is not a second best. In the vast majority of cases the defective hygiene and not the tonsils is the source of the sepsis; and when there is some sepsis in the tonsils the lymphoid tissue is of greater value in protecting against the hygiene of the home than the organisms within it are harmful.

On the rare occasions where tonsillectomy in such cases must be performed the child should be sent to a convalescent home for a fortnight, transferred direct to hospital, kept there for a week after operation, and then sent back to the convalescent home for another fortnight before being allowed home.

Personal

The layman often comments upon the disagreements that obtain between the opinions of different doctors, forgetting or perhaps not recognising that these are no greater than in any other sphere of mental activity. We must recognise that such are a part of medicine and must be prepared to withstand those to the face with whom we disagree. It is perhaps a cause of criticism to those who have long looked with disfavour upon the number of tonsillectomies performed that we have not done so more effectually before, and particularly we have not voiced our disapproval of the operation whereby the so-called lingual prolongation of the tonsil is removed. In this much of the lymphoid tissue on the base of the tongue is also taken, and when the adenoids are thoroughly removed the pharynx has practically been flayed of lymphoid

[3] This has proved wrong. Two cases of otitis media, one of which passed on to mastoiditis, have occurred in children operated on in November and December, 1933.

tissue. To the best of my knowledge no practising laryngologist approves of this operation. In my opinion it is unnecessarily severe and performed by a method that is unnecessarily dangerous; I further believe that it is fraught with grave consequences to the hearing even when all immediate post-operative complications have been avoided. But it is not with these points that this paper deals. The gravity of the matter lies in the fact that it is those who for years have advocated this operation who have also advised the removal of tonsils in very young children and have performed the operation on numbers of them.

It must be remembered that the great majority of tonsillectomies are not performed by practising laryngologists but by general surgeons or general practitioners many of whom have learnt this operation. It emanates from a single school, and the great influence that it has had on the practice of tonsillectomy may in part be attributed to two things. This school is the Mecca of English medical pædiatrics; and the young men who flock to its wards recognise its eminence in medicine, and tend to accept without criticism the virtue of large numbers of tonsillectomies that they see being performed. Secondly, I know of no other example in the history of surgery where an enthusiasm for an operation is shared by all members of the surgical staff. Surgical schools have become famous for thyroid or gastric work, but the fame has rested upon the efforts of two or three individuals. There have always been others who have not specialised in these operations, and have thereby exerted an influence which has caused the pioneers constantly to think whether they may have done one from time to time that is unnecessary or excessive in extent. At this school alone the whole surgical staff has, I believe, given itself over to this operation to which alone some of its advocates will allow the word tonsillectomy to be applied. Their industry, which is immense, may be admired. The leader of the school fourteen years ago acknowledged to have performed 18,000 such operations in twelve years; and I have reason to believe that some of his successors have exceeded the annual average of this total. One may wonder, however, whether the constant application of the mind to a dextrous manipulation of surgical instruments has left no time for thought either whether the operation may be wrong in principle or whether the indications for its performance are sufficient in every case.

I propose now to enumerate three groups of persons against whom I have found it hardest to persevere in opposition when I have felt I ought to do so.

(1) The first are medical officers in charge of public and other private schools. I am informed that as a group they disapprove whole-heartedly of the number of tonsillectomies that have been performed on the children by the time they reach their schools. There are, however, some who in my opinion do unduly demand the operation; and they are in a position almost to compel it when they do. Teachers and parents feel that the loss even of a fortnight at a certain age is disastrous to education. If the medical officer fears a further illness next term unless the tonsils are removed, a demand is made for tonsillectomy during the holidays which it is difficult to oppose, even though one knows that the time suggested is dangerously near the last or only infection of the upper respiratory tract to prevent the recurrence of which the operation is advised.

(2) The second are medical officers inspecting school-children in county council schools. So far as London is concerned these as a body probably act as a check upon excessive operation rather than as a spur to it; but when an individual one is an enthusiast for tonsillectomy, he or she may by indirect means exert considerable influence by suggesting that the children should be taken to some certain clinic and by carefully guiding them away from that where it is known that the medical officer advises but a few operations.

(3) The third, and in my opinion most difficult to oppose, are physicians. Again I do not suggest that all physicians are unduly enthusiastic for tonsillectomies; but some of them are, and others are inclined to demand it when they think it may be needed. The laryngologist's opinion is not always wanted. This is, however, not the whole of the tale. The physician of to-day does not seem to recognise the Hippocratic maxim with which we began this discussion, nor to realise that in advising operation he must take some responsibility for any complications that may arise after its performance. The generation that is arising does not seem to appreciate that tonsillectomy in an obese woman of forty-nine may be a very severe operation however skilfully it may be performed.

Further, there does not seem to-day a sufficient appreciation of the relationship of the likelihood of improvement from operation to the stage of the disease under consideration. Thus we may admit that the removal of any focal sepsis is the proper treatment for rheumatoid arthritis; but this does not mean that we should perform a tonsillectomy in an elderly woman who has long shown marked deformities of many joints.

In former days physicians have been the impartial critics who have been the drag upon excessive operations. It will be a bad day for medicine if this healthy influence is removed. The subconscious influences in favour of operation are potent enough without, in addition, the keen young surgeon having to oppose those who should be his best moderating influence.

But when all is said and done we laryngologists have the greatest responsibility. If we think that the number of tonsil operations has increased to an alarming extent we cannot absolve ourselves entirely. It is we that have to teach the subject to the young. It is true that many others do so as well. There is no part of medicine that the tonsil problem does not touch. It is true also that our opportunities for teaching are not great. We have the student but for a few days in all; and with the present crowded state of the curriculum we cannot demand more. During the time he is with us there is hardly time to do more than to teach him to accustom himself to the examination of the upper respiratory tract, and to apply to this area the principles of general medicine and surgery. In learning to make this examination the adults are more suitable than the children. I know that I do not spend enough time in discussion on children with my students. Further, we laryngologists are debarred from exerting the only influence that will compel all students to attend to a given subject, for we are given no place in the examination system. Yet the subject belongs to our department, and in spite of these disadvantages if we earnestly believe that too many operations are done we must do what we can to prevent them.

BRADFORD ROYAL INFIRMARY.—A Bradford citizen who wishes to remain anonymous has promised to give £20,000 to this institution on condition that the new building at Daisy Hill is completed within two years. Of the £500,000 appealed for, £360,000 has been promised; a new nurses' home will cost £50,000.

THE TREATMENT OF X RAY CARCINOMA AND X RAY DERMATITIS

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The experience of any one surgeon in the treatment of X ray carcinoma is necessarily limited, but it would appear that its bad prognosis is due largely to dilatory and incomplete operations for which the reluctance of the patient is perhaps mainly responsible. What usually has happened is that a series of small local excisions of warts or incipient carcinomata is undertaken over a period of years. Next perhaps a finger is removed. At this time the axillary glands are enlarged, but the fact that this enlargement may be merely of septic origin is allowed to cast a pink haze of optimism over the menacing but more likely alternative that they are neoplastic. An axillary dissection or an amputation is finally undertaken too late, and recurrence in the supraclavicular glands or in the lung terminates the case.

The general policy adopted in the management of these cases has been the piecemeal removal of obviously malignant lesions by a series of small local operations, a plan which would not for a moment be considered in dealing, for instance, with breast cancer. In every case within my personal knowledge where such a plan has been followed the ultimate result has been disastrous. I do not for a moment suggest that amputation of the hand or arm should be done for a small X ray epithelioma of the fingers. But an element of intelligent anticipation, based upon a knowledge of the mode of spread of the disease, is essential to its successful treatment.

THE SCOPE OF OPERATION

In my opinion, if a suspicious warty area locally excised is found to be a carcinoma, the patient's safety demands a complete gland dissection, so soon at latest as glandular enlargement can be detected in the axilla or in the supratrochlear gland of the affected side. The precaution is wise even in cases where the glands are normal to palpation, though it cannot then be so strongly urged. The object of the operation is *to cut the main line of dissemination at an early stage*. When once this has been done by the method now to be described the disease is no longer free to range over the body. It is confined in its spread to the region of the forearm and hand. Here its subsequent local manifestations can be dealt with at leisure by limited local operations, with the loss of the forearm as the most serious ultimate forfeit that is likely to be demanded.

Since in nearly all cases the first gland to be invaded is the supratrochlear gland, which lies on the internal intermuscular septum an inch or two above the medial epicondyle, a simple axillary dissection will not meet the case. Not only should the supratrochlear gland be removed, but with it should go the trunk-lymphatics which connect this gland with the axillary glands. The incision required begins at the junction of the anterior and medial walls of the axilla, passes across the front part of the axillary vault one inch behind the edge of the great pectoral to the insertion of that muscle, and continues down the medial side of the upper arm in a straight line to a point just above the internal epicondyle.

In the brachial part of the incision the skin and a layer of subcutaneous fat are reflected a little so as to expose a band of the deep fascia an inch wide extending from the supratrochlear gland to the axilla. The gland is dissected out, not cleanly, but with a sheath of the surrounding fat, and from below upwards. Above it is left in continuity with the exposed band of deep fascia, the edges of which are now defined by careful incisions through the fascia. It is now easy to strip up the fascia from the underlying muscles, nerves, and vessels as far as the axilla, but leaving it still in continuity with the axillary tissues.

The opening up of the axilla and the removal of its glandular and fatty contents is the next step. It is not necessary to divide either the great or the lesser pectoral in order to do this satisfactorily. The anterior axillary wall is first cleared and a right-angled retractor, passing immediately behind the great and lesser pectoral, lifts these muscles out of the way and permits the vein to be cleared along its whole length, and the apical glands of the axilla (subclavicular glands) to be reached and removed. The inexpert operator is almost certain to leave these glands behind.

The further steps in the axillary clearance need no special description, but when the intercostohumeral nerve is exposed it should be injected with alcohol before division, as a precaution against postoperative neuralgic pain. The dissection throughout should be a delicate and gentle one, since it passes in close proximity to the brachial plexus and its main branches. Even with these precautions brachial neuralgia may be troublesome for some time and may need sedatives. In my experience no other complication has followed the operation.

The portion of tissue removed is a single piece, consisting of the axillary tissues connected by a band of fascia with the supratrochlear gland.

THE NEGATIVE REPORT

If in every case of X ray dermatitis, or early local carcinoma following thereon, a complete axillary and bicipital gland removal is carried out as soon as enlarged glands can be felt—the course of action advocated in this paper—it is certain that in most cases the pathological report upon the glands will state that they are inflammatory only and not malignant.

The resulting situation must be faced frankly. The patient, probably a medical man, may in his own mind reproach the surgeon, who may be himself tortured by the same feeling, for performing an unnecessarily severe operation. The fear that such a situation may arise has probably in the past contributed to a delay which experience shows is fatal.

Let us consider the exact degree of validity which attaches to a negative report on a gland examined for carcinoma. One, or at most two or three glands are sectioned, and one, or at most two or three sections of each block are examined. The volume of tissue which actually passes under the pathologist's eye is perhaps one-hundredth to one-thousandth of the total volume of the gland. Let it be further borne in mind that single carcinoma cells are almost unrecognisable, and it will be seen that a negative report gives no firm assurance of the absence of carcinomatous infection from a gland.

But even assuming that the negative pathological report is correct, the case for the radical operation which has been performed is not in any way invalidated. The object of the operation is a preventive and

anticipatory one—to cut the main line of dissemination at an early date—and a negative report on the glands is to be welcomed as an additional assurance that this has been done in time.

It may be admitted that for a small apparently local carcinoma on a finger the temptation to amputate the finger and to ignore enlarged glands is great. To the patient the temptation to wait and see is well-nigh irresistible, but experience in many cases has shown that it is a fatal one. On the other hand the two cases here recorded appear to indicate that safety can be attained at a price, if that price is paid early and without haggling.

TWO ILLUSTRATIVE CASES

CASE 1.—A well-known British radiologist consulted me in June, 1931, for an ulcer on a digit of the left hand which had been present for two years. It appeared upon an area of chronic warty X ray dermatitis of long standing, affecting both hands. The ulcer presented a granulating surface and measured 1¼ in. by ¾ in. It had been treated by Dermatol ointment.

In 1930 an acute dermatitis started on the skin of the left hand and spread over the whole body, and was so intense that at its height multiple incisions were suggested to relieve it though they were not made. Casts of the epidermis of the fingers came away as the inflammation subsided, and for a time all the warts on the hands disappeared.

On examining the ulcer I found a ring of subcutaneous induration all round its edge and formed the opinion that it was carcinomatous. The left bicipital gland and one left axillary gland were enlarged. On June 30th, 1931, I amputated the ulcerated finger which proved on frozen section by Dr. Ernest Shaw to be carcinomatous. I then excised the bicipital and all the left axillary glands, with an intervening band of deep fascia. The wound healed well but the patient suffered for some weeks from troublesome brachial neuralgia.

Sections of the glands failed to show carcinomatous invasion. In January, 1934, the patient remains well and is conducting a large professional practice.

CASE 2.—Dr. A., a well-known continental radiologist, was sent to me by Prof. Claude Regaud on July 28th, 1931. Dr. A. first employed X rays in 1895 and both his hands suffered from X ray burns in 1901. Recovery followed, but in 1918 the right hand developed severe chronic X ray dermatitis with warts, epithelial thickenings, and superficial ulcerations. Amputation of the hand was advised by a Paris surgeon. After some delay the right fifth digit was amputated for a definite carcinoma.

When I first saw the patient a carcinomatous growth involved the bases of the index and middle fingers and extended into the palm of the hand. (See Figure.) The axillary and bicipital glands were enlarged and hard. The little finger had been amputated. The fourth digit presented a round superficial ulcer about an inch in diameter which was not at the time thought to be malignant. An axillary gland dissection had not been advised, though he had recently consulted several surgeons abroad.

On July 29th, 1931, I excised the growth with the second and third digits and the distal portions of the second and third metacarpals. I then removed the bicipital and axillary glands and the intervening portion of deep fascia carrying the lymphatic vessels. An uneventful convalescence followed.

The largest axillary gland showed massive deposits of carcinoma with cell-nests. The primary growth was a typical squamous-celled carcinoma. The adjoining skin and subcutaneous tissue was in a fibrotic condition and presented areas of round-celled sub-epithelial infiltration. The ulcer on the fourth digit refused to heal. It was shaved off and skin grafted some weeks later, but a section of the slice removed showed carcinoma, and the finger was accordingly amputated with much regret since the power of apposition was thereby necessarily lost.

In May, 1933, Dr. A. wrote to me as follows: "In reply to your letter of enquiry I beg to state that my present state of health is excellent. I have no pain at all at the seat of operation, nor any glandular trouble, the digestion and general health are in good normal condition in spite of my continued stress of work in the medical profession, and in the great cause of humanity." He remains well up to date (January, 1934).

TREATMENT OF X RAY DERMATITIS

In this paper I do not propose to go into the pathology of chronic X ray dermatitis, which I have discussed in my book on "The Genesis of Cancer" (London, 1931). It appears to depend upon a proliferative lymphangitis of the skin lymphatics set up directly or indirectly by the action of the rays, and leading to the more or less complete obstruction of these vessels. When a papillary lymphatic is blocked the papilla swells up as a physical consequence of the failure of the blocked lymphatic to carry off the fluid which is transuding into the tissues of the papilla from the blood-vessels. The papilla elongates and broadens and its connective tissue and the epithelium overlying it receive a nutritional stimulus to proliferation which results in the formation of a papillary hypertrophy or wart. It is possible also that X rays exert a direct stimulating action on epithelial proliferation.

The lesions in Case 2.

Clinical considerations however appear to indicate that in the papillary lymphangitis of X ray dermatitis a very important part is played by the skin bacteria, and particularly by the staphylococcus, which is a normal inhabitant of the skin. It would appear that radiation lowers the resistance of the skin to staphylococcal invasions, and that X ray dermatitis might be more correctly described as a chronic staphylococcal dermatitis produced by radiation. The practical importance of the distinction I am attempting to draw may perhaps seem

doubtful, but it is possible to show that it has a very important bearing on treatment.

Let me in the first place draw attention to the acute generalised dermatitis which occurred in Case 1 and spread over the whole body. Here there could be no doubt about the intervention of a bacterial element. Owing to some lowering of the general resistance a process which had been confined to the hands extended to the whole of the skin.

But the main evidence for the staphylococcal nature of X ray dermatitis lies in my success with antistaphylococcal measures, adopted at first quite experimentally, in its treatment. The results of the application of mixed staphylococcus antivirus are in some cases so rapid and striking that there seems no doubt as to the specifically staphylococcic and infective character of X ray dermatitis. The best method of application is to soak a cotton glove or portion of a glove in the antivirus, and to wear the wet glove at night with a rubber glove over it. I hope that any radiologist who tries this method will send me his personal estimate of its effectiveness.

The debt of surgery to radiology is incalculable. I offer this paper as an evidence of appreciation of that debt, and of a desire to be useful in return. A few cases of pioneer X ray dermatitis still remain among us, but if rational principles are applied to their treatment I confidently hope that Dr. Hope Fowler's distinguished name will be the last added to the roll of honour on which are inscribed my friends, C. R. C. Lyster,[1] G. E. Mann,[2] and Alfred Smith.[3] I rejoice to think that the bad time of radiology is over, and that for the future X ray carcinoma is preventable and will be prevented.

FAMILIAL CHONDRODYSTROPHY WITH RHEOSTOSIS

TREATED BY X RAY THERAPY

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A CASE of bone tumour which presents peculiar features and does not seem to fit into any group previously described appears to be worthy of record.

A girl, aged 10, with a bilateral tumour of the thigh, had begun to complain of pain in the lower end of the left femur three weeks before admission to hospital; shortly after the onset of pain a swelling appeared.

Past history.—Her birth was normal. Though always small and thin, she had been well until the age of 9, when she had fractured her left ankle, which healed well. There had been no pains in the limbs.

Condition on examination.—The child was obviously ill; her temperature was 103° F. The musculature was poor and the body generally under-developed; height 42 in., weight 32 lb. Intelligence appeared normal. No abnormality was discovered in the cardiovascular and respiratory systems. The reflexes were natural. The liver and spleen were not palpable. A number of hard shotty glands were palpable in both groins.

The left thigh presented a large, hard, non-pulsatile swelling extending from the inner condyle upwards for 3 in. It was definitely tender over its most prominent part. There was no evidence of fluid in the knee-joint. The right thigh showed a smaller swelling, beginning 2 in. above the inner condyle, which rose sharply from the bone and extended upwards for a further 2 in. It was slightly tender. The elbow-joints both showed a deformity. The head of the radius was dislocated forwards and outwards on the humerus, and the forearms were held in a position of semi-pronation. There was only about 5° of rotation of the radius.

A radiogram of the *left femur* (Fig. 1) showed new bone-formation outside the level of the periosteum in the soft tissues. It did not encircle the bone but was present on the posterior, medial, and lateral aspects. The pattern of the new bone was hazy and its margin ill-defined. Underlying the tumour and still outside the level of the original periosteum there was, in addition, an irregular layer of new bone-formation running parallel to the shaft along its entire length. Slight thickening of the cortex was noticeable but little medullary involvement, apart from some widening of the longitudinal trabeculæ. The epiphyseal line was thickened and wavy in all the long bones.

Right femur.—The radiogram showed the same hyperostosis along the shaft and a small amount of new bone-formation in the soft tissues at its lower end. The pattern of the new bone-formation was however more distinct than that seen on the left side.

Both *humeri* showed hyperostotic ridges on the outer aspect of the upper third.

Left forearm.—A radiogram confirmed the fact that the head of the radius was dislocated forwards and outwards on the humerus. Hyperostotic ridges were visible outside the cortical area along the upper and outer side of the radius. The interosseous membrane was partially calcified.

Left fibula.—Hyperostotic ridges were seen along the lower end of the fibula.

Scapulæ.—The bony outline was irregular.

Vertebræ.—The bodies were small, irregular, and wedge-shaped.

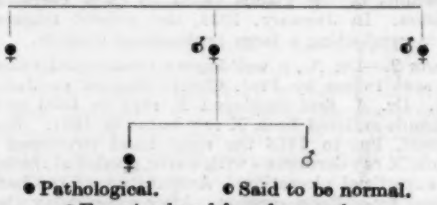
Some of the *metacarpals and metatarsals* showed hyperostotic ridges.

Skull and chest.—Nothing abnormal was seen.

A biopsy was performed on the tumour on the left femur. The section is shown in Fig. 4.

The blood calcium was 10·3 mg. per cent. and the plasma phosphorus 3·6 mg. per cent. The urine was normal. The Wassermann reaction was negative. A complete blood count revealed nothing abnormal.

Family history.—The father is said to be normal; there has been no opportunity of examining him. The mother, aged 31, is small and under-developed, but otherwise healthy. An X ray of her femur revealed a hyperostotic ridge with a wavy outline running along the inner and posterior aspect of the upper part of the shaft. The cortex in this region was slightly thickened, but otherwise the structure of the bone appeared normal.



● Pathological. ◐ Said to be normal.
○ Examined and found normal.

An X ray of her forearm showed dislocation of the upper end of the radius, similar to that of the daughter. One brother, aged 2, has been radiologically examined and found normal. One maternal aunt, aged 36, resembled the patient's mother in having a hyperostotic ridge along the femur and the dislocation of the head of the radius. A second maternal aunt (S.), aged 24, who is severely deformed, was found to have changes in the bones similar to those of the patient, but of a more pronounced character. Practically all the bones were involved and some of the joints were also affected. The long bones were bowed and showed expansion in part. The cortex was narrowed; the longitudinal bone trabeculæ were widened, the transverse trabeculæ were scanty and in some parts there was cyst-formation. Hyperostotic ridges, with a wavy outline

[1] Radiologist to the Middlesex Hospital, 1902–19.
[2] Radiographer to the Middlesex Hospital, 1900–16.
[3] Formerly dispenser to the Samaritan Hospital, and later radiographer to the Coventry Hospital.

along the shaft, were present in all the long bones. Spurs of bone were present in the head of the fibula and the olecranon, and in other situations. The joints, particularly at the elbows, were overlapped by irregular confluent shadows which completely obscured the joint space (Fig. 5 and Fig. 6).

Technique of X ray treatment.—The lower ends of both femora were treated. Kilovoltage, 16 in. spark gap (point to plate) changed to 190 kv. continuous current after the first course of treatment. Filter: 1 mm. copper, 1 mm. aluminium. Focus: skin distance, 30 cm. Ports of entry: 48 sq. cm.; two fields were used.

Date in 1932.	Dosage to each field.	Period in days.
Feb. 24th	700 r.	10
March 17th	700 r.	15
May 11th	700 r.	10
June 30th	300 r.	2
August 31st	450 r.	3
Nov. 7th	300 r.	4
Dec. 12th	150 r.	1

Notes.—The first five treatments were given to both femora; the last two only to the left femur.

RESULT OF TREATMENT

After the first ten days of treatment there was a great increase in the size of the bone tumours at the lower end of both femora. The pattern of the bony tissue became distinct and the margin of the tumours clearly defined (Fig. 2).

Date in 1932.	Weight. st.	lb.	oz.	Height.
Feb. 22nd	2	4	8	—
				Treatment begun.
March 29th	2	5	14	42 in.
August 30th	3	0	4	44 in.
Nov. 7th	3	5	0	47·5 in.

After the second course of treatment, which began on March 17th, 1932, a continuous decrease was noticed in the size of the tumours. This was

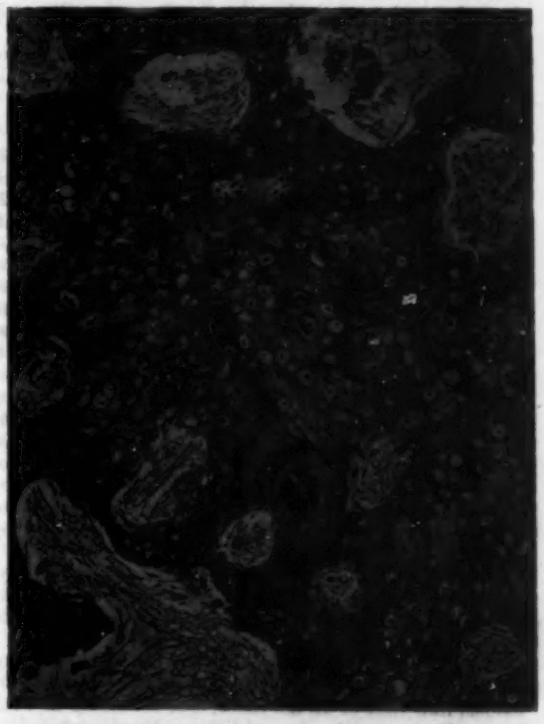


FIG. 4.—Section of tumour of left femur showing bony trabeculæ having no definite arrangement. Ramifying between these are stout columns of very vascular and rather loose connective tissue. Along the line of separation between fibrous tissue and bone are a number of osteoclasts. From the appearance of the neighbouring bone little absorption is taking place.

FIGS. 1 2 3 5 6

FIG. 1. — Left femur before treatment.

FIG. 2.—Left femur after first course of treatment, showing increase in size of tumour.

FIG. 3.—Left femur at the end of treatment.

FIG. 5.—Radiogram of elbow and forearm of maternal aunt.

FIG. 6.—Radiogram of tibia and fibula of maternal aunt.

associated with a reduction in the amount of new bone-formation outside the periosteum (Fig. 3) and a definite decrease of pain in the legs, with a rapid improvement in the general condition. The patient gained over 14 lb. in weight and 5½ in. in height.

DIFFERENTIAL DIAGNOSIS

A search in the extensive literature of the subject has failed to reveal any case the same as this one in every particular. Léri and Joanny [1] in 1922 described a hyperostosis which ran down the shaft of the bone. They called it *melorheostosis* (μέλος, limb; ῥέω, flow). Kraft [2] described two further examples of the same condition, and reviewed those which had been reported since the first case mentioned. The case here described differs from these in that: (1) the condition is bilateral and affects both upper and lower extremities instead of one extremity only; (2) no familial tendency disease was recorded in the previous cases, whereas in the one now described the condition, with variations, has been found in four females in the family and not in the two males; (3) the present case is associated with chondrodystrophy as manifested by the congenital dislocation of the head of the radius and by the wedge-shaped vertebræ.

With regard to the localisation in one extremity, said to be characteristic of melorheostosis, in one case described by Léri some nodules are reported to have developed in the opposite side.

Hirsch [3] has described a case similar to that of the maternal aunt, the patient showing a hyperostosis like that of Léri's cases, but occurring in both lower limbs, with, in addition, bone expansion, generalised rarefaction, and cyst-formation. He terms his case "metaplastic and hyperplastic malacia," and classes it as a subdivision of generalised osteitis fibrosa. The difference between this case and the maternal aunt of our patient is one of distribution of lesions. In our case, in addition, there is a family history of the disease.

Ossifying periostitis.—If the hyperostosis were confined to one limb it might be confused with ossifying periostitis. The latter, however, occurs as a single lesion, and is caused by severe trauma, syphilis, or focal infection. The history, the course of the disease, the physical examination, and the Wassermann reaction rule out this diagnosis in the case described.

Osteoblastic osteogenic sarcoma.—The radiological appearance of the femur, at its lower end, at first was thought to resemble a sarcoma (see Fig. 1). But the distribution of the lesions and the type of response to treatment, coupled with the family history, put this diagnosis out of court.

Multiple exostosis.—The appearance after treatment of the hyperostoses on the femora in our case resembles in some points the flat, table-like exostosis seen in cases of hereditary multiple exostoses (Keith [4]). These flat exostoses are always situated in the metaphyseal region, and they do not extend along the shaft from one end to the other; also they are associated with numerous exostoses of typical shape in the same region. There is, in addition, widening of the metaphyseal ends of the bones and much bone distortion. The deformities are mostly in the cortex of the bone, which may be widened at irregular intervals along the shaft. This gives the bone a wavy outline similar to that of the bones in our case. In the latter, however, it is not the cortex which is irregular in outline, but the hyperostosis which lies outside the level of the original periosteum. Engelmann [5] has described a case in which all the long bones were symmetrically affected by a thick hyperostosis. The lesion, however, involved the whole circumference of the long bones. The metacarpal and metatarsal bones were not affected. The bone in the region of the hyperostosis was sclerosed and not rarified. The changes in the bone were accompanied by a slight anæmia, and a relative increase in lymphocytes, monocytes, and eosinophils. No other members of the family were affected.

PATHOGENY

The congenital dislocation of the upper end of the radius and the wedge-shaped vertebræ, as seen in this case, can be explained by some abnormality in the cartilaginous stage of development of bone. It seems probable that the lesions along the shaft of the bones (rheostosis), which here form the most striking part of the syndrome, can be explained by the same cause. According to Harris, [6] mild degrees of "interference with the nutrition of the proliferating cartilage might lead to perversion in the end of the bone, the shaft of the bone, or the articular cartilage in the joint cavity." If this view is correct the essential pathogeny of the condition would be the chondrodystrophy, the rheostosis being one of its manifestations.

SUMMARY

1. A case is described of a female child of 10 presenting deficient growth and painful tumours at the lower end of both femora; the X ray appearances were those of a rheostosis of certain bones, together with signs of chondrodystrophy. Histological appearances are described.

2. The mother of the patient and two maternal aunts are also affected.

3. The name suggested for the syndrome is familial chondrodystrophy with multiple rheostoses.

4. The differential diagnosis is made from: (*a*) melorheostosis; (*b*) metaplastic and hyperplastic malacia; (*c*) ossifying periostitis; (*d*) osteoblastic osteogenic sarcoma; (*e*) multiple exostoses (diaphyseal aclasis); (*f*) osteopathia hyperostotica multiplex infantilis.

5. The response to X ray therapy was rapid and satisfactory.

For permission to publish the notes on this case I am indebted to Dr. R. Salmond, in whose department this case was treated, and to Mr. Julian Taylor, under whose care the patient was while in the wards of the hospital.

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ORDER OF ST. JOHN OF JERUSALEM.—The following promotions and appointments have been sanctioned by the King. *As Commander*: Dr. W. H. Carse and Dr. F. Howard Humphris. *As Officer*: Lieut.-Colonel A. D. Stewart, I.M.S., Mr. J. J. Abraham, Major H. A. Sandiford, R.A.M.C., and Dr. W. H. Kauntze. *As Serving Brother*: Dr. H. G. Hankins, Mr. C. A. Parker, Dr. F. H. Flack, Dr. J. W. Graham, Dr. J. M. Postlethwaite, Dr. P. McRitchie, Dr. F. E. Bendix, Dr. H. F. Percival, Dr. W. E. Fairweather, and Lieut.-Colonel C. H. James.

THE RELATION OF THE IMPEDANCE ANGLE TEST FOR THYROTOXICOSIS TO CHANGES IN BASAL METABOLISM

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SINCE it has been demonstrated [1] that the impedance angle forms a very reliable aid to the diagnosis of toxic conditions of the thyroid gland, the present investigation was undertaken to determine whether a rise in impedance angle was specific to thyrotoxicosis or whether any factor causing a change of basal metabolism would cause a corresponding change of the impedance angle.

It has already been shown [2] that the impedance angle is unaffected by meals, exercise, or by menstruation; in the present paper the influence is studied of both sympathetic and parasympathetic drugs, of thyroid extract, and of thyroxine. The method used throughout for the estimation of the impedance angle (I.A.) has been very fully detailed elsewhere,[2] so that no further description of the technique is necessary.

For the basal metabolic rate determinations Kendrick's portable B.M.R. recording apparatus was used with a modified nasal attachment.

This attachment consisted of two rubber teats from which the tops of the bulbs had been removed so as to allow free air-way when a teat was fitted into each nostril. The lower ends of the teats were attached each to one limb of a Y-shaped glass tube and the stem of this tube fitted to a two-way valve which again connected by tubing to the oxygen cylinder. Paraffin wax smeared thickly round the junction of the teats with the nose ensured the whole being air-tight. The patient was instructed to keep the mouth closed during the whole experiment, and practice was given until this, as well as the required quiet and regular breathing, was achieved. The nasal tubes in place of the mouth respirator have been found to ensure quiet normal breathing in the majority of subjects. The effect is a psychological one—the use of a mouthpiece suggests to most subjects the necessity of forced breathing and puffing, whilst the presence of the nasal tubes is readily forgotten and patients have been known to sleep when using them.

The subjects for these experiments were in-patients at the Maudsley Hospital and were suffering from borderline mental disturbances; only those cases who showed no apparent endocrine dysfunction and who were in an approximately stationary clinical condition were selected for this study.

The general proceeding was to take readings of both the I.A. and the B.M.R. before the drug was given, the treatment not being started until consistent readings were obtained. No change in B.M.R. was regarded as significant unless it were over 10 per cent., nor was any change in I.A. of less than + 10 or − 10 taken as significant. This latter standard was adopted since the standard deviation for the I.A. of a group of normal people had been found to be 10·1.[2] The standard of a 10 per cent. variation in B.M.R. was taken as significant because no readings on the subjects before treatment showed as great a variation as this. In order to achieve this high standard of reliability and consistency in the subjects for these experiments, the selection had to be very strict. In all 107 cases were chosen and tested, but of these 42 had to be abandoned as unreliable.

The drugs investigated were ephedrine, atropine, pilocarpine, thyroid extract, thyroxine, and iodine.

Experimental Results

EPHEDRINE

After a series of readings had established the normal values for the B.M.R. and I.A. of each subject, a fina reading of the B.M.R. was taken and without disturbl ing the patient 0·06 g. (gr. 1) of ephedrine was administered by mouth, and observations were taken of the rise in pulse-rate. Twenty-five minutes after the drug was taken a further reading of the B.M.R. was made and any change noted. Since the patient had not moved except in so far as to swallow the tablet, any significant change in the B.M.R. was ascribed to the action of the drug (the rise in B.M.R. due to the ingestion of the mouthful of water taken with the tablet being extremely small). When the B.M.R. estimation had been completed (on an average 40 minutes after the drug was taken) a reading was taken of the impedance angle.

In every case, both for ephedrine and for every other drug, control experiments were made on the same patient on a different day, in which the same dose was given and a reading of the I.A. made 25 minutes after the drug was taken. This control was undertaken to avoid any error due to its being impossible to observe the B.M.R. and the I.A. simultaneously. It was found (with the exception detailed below) that in every case and with every drug there was a complete agreement between the I.A. readings for the original experiment at 45 minutes and for the control at 25 minutes, so that no error due to time relations was introduced.

The results for 12 cases to whom ephedrine was administered are given in Table I. This Table

TABLE I.—*Ephedrine*

Cases. (All males.)	Normal I.A. (mean).	Change in I.A. after ephedrine.	Normal B.M.R. (mean).	Change in B.M.R. after ephedrine.
			Per cent.	
1	+22	0	−13	+19
2	+12	+1	−25	+27
3	+11	+3	− 6	+16
4	+10	−1	−12	+17
5	+ 5	−1	−19	+18
6	+38	+4	− 9	+13
7	+ 5	−1	− 6	+12
8	−16	−2	− 9	+11
9	+ 4	+5	+ 3	+18
10	+23	+5	− 6	+10
11	+29	0	− 6	+16
12	− 6	+3	−20	+25
Average change ..		+1·3	—	+16·9

demonstrates very clearly that ephedrine causes an increase in B.M.R. (in every case the rise was greater than the accepted standard), but in no case was there a significant change in I.A. The conclusion is therefore reached that although the B.M.R. can be raised by the administration of ephedrine, this increase in metabolism is not accompanied by any change in impedance angle.

ATROPINE

Exactly the same procedure was followed as with ephedrine. On completing the final normal B.M.R. reading 0·0013 g. (gr. 1/50) atropine was given by mouth and a further estimation of the B.M.R. was made 25 minutes later, the same control readings being made for the impedance angle.

Should a reaction take place it should occur within this time interval, since there is a linear reaction between the log of the dose of atropine and the

duration of the action produced ;[3] hence, a very large dose is required to maintain an action for a long period.

From Table II. it will be seen that in no case was there any effect on the basal metabolic rate following atropine ingestion. Nor was there any change in impedance angle except in Case 11 on the first occasion on which the drug was administered to this patient. Since this was an anomalous case in this series, the

TABLE II.—*Atropine*

Cases. (All males.)	Normal I.A. (mean).	Change in I.A. after atropine.	Normal B.M.R. (mean).	Change in B.M.R. after atropine.
			Per cent.	
1	− 6	− 1	−23	− 2
2	− 6	− 3	−16	+ 1
3	− 1	+ 2	−13	+ 4
4	+16	− 5	−12	+ 5
5	0	− 2	± 0	0
6	− 5	− 4	− 2	+ 4
7	− 8	+ 5	−11	+ 4
8	+15	+ 5	− 5	+ 3
9	−20	− 2	− 5	+10
10	−14	+ 9	− 4	+ 2
11	+ 7	−25	−11	+ 2
	−21	+ 3	—	—
	+14	− 4	—	—
12	+23	+ 3	+ 6	+ 3
Average change ..		− 1·5	—	+ 3

experiment was repeated twice on different days ; in neither of these repeated experiments was there any significant change in I.A. The normal I.A. of this particular patient was found to be extremely inconstant (+ 7, − 21, and + 14 on three different days), and hence no particular significance is attached to the one instance in which there was an apparent change in I.A. after atropine. This inconstancy of the normal readings for the I.A. is very rarely found, and cannot yet be explained. Even if this anomalous result is included in the series the average change in I.A. of all the cases is only − 1·5.

The conclusion from this series of results is therefore that atropine has no effect on either the B.M.R. or I.A. Papilian and Bendescu [4] found that atropine diminished the B.M.R. (seven cases), but they do not state the dose administered. The above results do not confirm this for a dose of 0·0013 g. (gr. 1/50).

PILOCARPINE

The dose given was in every case 0·006 g. (gr. 1/10) injected subcutaneously, the procedure of examination

TABLE III.—*Pilocarpine*

Cases. (All males.)	Normal I.A. (mean).	Change in I.A. after pilocarpine.	Normal B.M.R. (mean).	Change in B.M.R. after pilocarpine.
			Per cent.	
1	−16	+ 1	− 6	− 2
2	+ 4	+12	− 1	+10
	+ 3	+ 3	—	—
3	+33	− 2	+12	+ 6
4	+29	− 1	− 8	+ 7
5	− 1	+ 1	−15	+ 9
6	− 8	+ 4	− 2	+ 7
7	+ 2	− 8	−6·4	+12
8	+16	− 5	− 4	+ 9
9	− 1	− 8	−20	+12
10	+ 1	+ 3	± 0	+ 4
11	+15	− 2	+14	+13
12	+15	0	−16	+ 7
Average change ..		− 0·2	—	+ 7·8

being exactly similar to that followed for ephedrine and atropine. Sweating was a constant feature of the reaction in every case. Of this series of 12 cases only 4 gave a significant rise in B.M.R., although it is noticeable that all except one gave a plus variation. It would appear that with this dose there is a tendency for the B.M.R. to increase ; Papilian and Bendescu found an increase in B.M.R. in 6 out of 7 cases to whom pilocarpine was administered (dose not specified).

The impedance angle was unaffected by pilocarpine. Case 2 gave a rise of 12 per cent. on the first injection, but when this was repeated on a different day this increase was not confirmed.

The conclusion is reached that there is a tendency for the B.M.R. to increase after pilocarpine injection, but that this drug has no effect on the impedance angle.

THYROID EXTRACT

In view of the consistent increase in I.A. which has been found to accompany thyrotoxicosis,[1] it was decided to investigate whether a similar increase could be induced in a person with no thyroid dysfunction as a result of prolonged thyroid feeding.

In all cases the initial dose given was 0·03 g. (gr. ½) b.d. by mouth of the dried extract (Armour). This dose was usually increased within a week, the maximum dose reached being 0·03 to 0·18 g. (grs. ½ to 3) administered in three doses per diem. The average duration of the thyroid feeding was six weeks, but this as well as the size of the dose, varied with the clinical condition of the patient.

The results for 12 cases treated in this way are given in Table IV. The first point which is noticed

TABLE IV.—*Thyroid Feeding*

Cases	Maximum dose given.	Duration of treatment, in weeks.	Normal I.A. (mean).	Maximum change in I.A.	Normal B.M.R. (mean).	Maximum change in B.M.R.
					Per cent.	
1 ♂	gr. ½ t.d.s.	4	−16	+17	− 8	+ 6
2 ♂	,, ½ b.d.	6	− 6	+13	± 0	+ 7
3 ♂	,, ½ t.d.s.	8	+ 1	+32	+ 8	+14
4 ♂	,, ½ ,,	5	+ 4	+13	+ 3	+11
5 ♂	,, ½ ,,	5	−14	+26	−10	+22
6 ♂	,, ½ ,,	9	− 4	+26	+12	+22
7 ♂	,, 1 ,,	7	−29	+25	− 3	+10
8 ♂	,, ½ ,,	3½	−38	+34	− 8	+14
9 ♂	,, 1 b.d.	5½	+ 6	+19	− 8	+16
10 ♀	,, 1 t.d.s.	5	−36	+32	−19	+26
11 ♀	,, 1 ,,	5	−23	−13	− 6	+13
12 ♀	,, 3 b.d.	6½	+ 3	+ 1	− 9	+ 4
Average change ..		—	—	+18·8	—	+13·8

is that not all the cases reacted to thyroid feeding. Case 12, in spite of quite large doses (grs. 3 b.d.), showed no change in B.M.R. or in I.A. In Cases 1 and 2 the rise in B.M.R. is not significant, but in all the other cases the B.M.R. increased and was accompanied by large increases in the I.A. with the exception of Case 11. The B.M.R. of this patient only rose by 13 per cent. and the I.A. actually decreased ; this decrease cannot be accounted for. The clinical condition of this patient was unfortunately not stationary.

Taking the series as a whole, there can be no doubt that the impedance angle is extremely sensitive to thyroid feeding in those cases which react to it, as indicated by the B.M.R.

In one case only was the thyroid extract injected (grs. 3). In this case the B.M.R. rose within an hour from − 8 per cent. to + 3 per cent., and the impedance angle from − 15 to + 5.

THYROXINE

This drug was administered in every case as a single dose, 2 mg. being injected intramuscularly. In no case did any reaction manifest itself until the

fourth day, the average being the fifth day. This is in keeping with the observation of Plummer [5] that doses of 2 mg. thyroxine may raise the basal metabolism of the normal individual, but that no effect is produced until about the fifth day after injection. This long latent period before any reaction is produced can be explained on Kendall's hypothesis [6] that the thyroxine has to undergo chemical change before any physiological activity occurs; its form in the tissues probably containing a second hydroxyl group.

TABLE V.—*Thyroxine*

Cases.	Normal I.A. (mean).	Maximum change in I.A.	Normal B.M.R. (mean).	Maximum change in B.M.R.
			Per cent.	
1 ♂	−19	+15	− 8	+ 5
2 ♂	−18	+ 8	+ 6	—
3 ♀	−36	+15	+ 7	+13
4 ♀	+ 3	+17	− 3	+ 9
5 ♂	− 6	+20	− 9	+14
6 ♂	−13	+10	− 7	−10
7 ♀	+ 7	+ 2	−10	+ 6
8 ♀	−19	+17	− 7	+16
9 ♀	+25	+ 1	− 9	+ 8
10 ♀	+ 7	−19	−17	+ 4
11 ♀	− 2	+ 8	− 8	+ 1
12 ♀	+ 9	+ 1	+ 8	− 1
13 ♀	+ 6	+10	− 5	+13
14 ♀	+41	+ 2	−15	+ 6
Average change ..		+ 7	—	+ 6

From Table V. it will be seen that very few of the cases reacted to this dose of thyroxine when change in B.M.R. is taken as the criterion. Cases 1, 4, 6, 7, 9, 10, 11, 12, and 14 did not give a significant increase in B.M.R., and of these only Cases 1 and 4 gave a significant increase in I.A.; possibly the I.A. may be a more sensitive test for reaction than is the B.M.R. Of the cases which gave an increase in B.M.R., all gave a simultaneous rise in I.A. It is concluded, therefore, that any reaction due to thyroxine injection as indicated by the B.M.R. is accompanied by a rise in impedance angle.

IODINE

In view of the use of iodine in the pre-operative treatment of thyrotoxicosis and the temporary lowering of B.M.R. which usually results from this treatment,[7] a study was undertaken of the effect of iodine administration on the B.M.R. and I.A. of cases with no thyroid dysfunction.

Since it is very generally found that the beneficial results of iodine therapy in thyrotoxicosis are only temporary, reaching the maximum effect in 10–14 days,[7 8] the following routine was adopted. When consistent normal readings for the I.A. and B.M.R. had been obtained on the selected cases, the patients were given tincture of iodine (2·5 per cent. weight over volume iodine and 1·5 per cent. weight over volume potassium iodide) and readings of both B.M.R. and I.A. were made on the seventh and fourteenth days of administration. After the fourteenth day the iodine therapy was discontinued and check readings were taken on the seventh day after stopping the drug.

Two series of experiments were made. In the first the dose given was 0·3 c.cm. (♏ 5) thrice daily for 14 days, and in the second series 0·6 c.cm. (♏ 10) thrice daily for 14 days. The results for the two series are given in Table VI. (A) and (B).

In neither series is there any consistent effect on the B.M.R.; there are as many positive changes as there are negative changes, and of these only one in each series exceeds the standard of + 10. In series (A), Case 4 gave a total change in B.M.R. on the fourteenth day of + 12 per cent., and in series (B) Case 4 gave a total change of − 16 per cent. In no case was there any significant change in impedance angle.

TABLE VI. (A).—*Iodine* ♏ 5 *t.d.s.*

Cases. (All male.)	Normal I.A. (mean).	Total change in I.A. on 14th day.	Normal B.M.R. (mean).	Total change in B.M.R. on 14th day.
			Per cent.	
1	+ 9	+7	+2	+ 3
2	−15	−7	+5	− 8
3	−21	+1	+6	− 5
4	+21	−1	−1	+12
5	+23	−6	−3	−10
Average change ..		−1·2	—	− 1·6

TABLE VI. (B).—*Iodine* ♏ 10 *t.d.s.*

All male.			Per cent.	
1	+23	+4	+6	− 6
2	− 7	+9	+2	− 2
3	+ 8	+4	−2	+ 3
4	− 5	+5	+7	−16
5	− 3	+1	−4	+ 7
6	+10	+3	−6	+ 1
Average change ..		+4·5	—	− 2·2

It is therefore concluded that iodine administration has no effect on either the impedance angle or the B.M.R. of persons in whom the thyroid gland is normal. These observations on the effect of iodine on the B.M.R. of normal persons confirm the work of Liebesney [9] and of Martin [8] who have shown that there is no reaction even to quite large doses.

Further Investigations

An investigation is at present proceeding on the effect of the thyrotropic hormone of the anterior lobe of the pituitary; it is also intended to extend this research to include the study of the effect of di-iodotyrosine and of 3 : 5 di-iodothyronine.

Conclusions

It has been shown that in keeping with previous observations the basal metabolic rate is increased by ephedrine, pilocarpine, thyroid extract, and thyroxine, but not by atropine or iodine in the normal person. Of these drugs only thyroid extract and thyroxine have any effect on the impedance angle. It is therefore concluded that change in impedance angle is specific to a thyroid factor and is not affected by chemical stimulation of the autonomic system reacting on the B.M.R.

Our thanks are due to Dr. F. L. Golla, director of the Central Pathological Laboratory, for help and advice, and to Dr. E. Mapother, medical superintendent of the Maudsley Hospital, and his staff for facility in investigating the cases. The research was carried out with the aid of a grant to one of us from the Medical Research Council and a grant made to the other worker from the Maudsley research fund by the London County Council.

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EFFECT OF LIGHT TREATMENT ON LARYNGEAL TUBERCULOSIS

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IN 1914 one of us (O. S.) introduced the universal carbon-arc light bath and he has since recommended it as the most effective remedy for tuberculosis of the larynx. During the following years he combined this treatment with local intervention (galvano-cauterisation, excisions, &c.). By this combination he was able to publish such results as had hitherto been considered unobtainable in this serious condition. Although his method was used chiefly among poor out-patients, his proportion of cures was so high as to encourage the adoption of his method on more systematic lines in combination with the systematic treatment of the lung lesions, as carried out in sanatoria.

His publications resulted in a joint investigation at Vejlefjord Sanatorium, where in 1926 the other author (J. G.), together with Godbey, had studied the results hitherto obtained in laryngeal disease by sanatorium treatment. This investigation [1] showed that the light treatment produced considerably better results in tuberculosis of the larynx, whereas the sanatorium treatment was far more effective for pulmonary disease.

We have continued to coöperate at the Vejlefjord Sanatorium since 1926, and in 1929 we published preliminary results,[2] which showed a higher percentage of cures than we had dared to expect. At the present time, after more than six years of coöperation, our preliminary experiences have been verified to such an extent as to warrant the presentation of our views to the medical profession in general.

Another reason for this paper is that this special method, it seems to us, has been represented to British readers in a somewhat misleading form. Sir StClair Thomson [3] has published his experiences with light treatment in laryngeal tuberculosis at Midhurst Sanatorium. When he comes to the conclusion that light treatment has no striking effect upon the laryngeal lesion, we cannot help feeling that this is due to a technique and a modus operandi which is far different from ours. Sir StClair Thomson's patients are treated with light baths for only half an hour, whereas our patients are treated for one and a half to two hours. He excludes from this treatment patients who are losing weight or are febrile before or early in the treatment. On the whole his treatment seems to us to differ so much from the systematic lines we have followed, and his selection of cases seems to be so different, as to make his results not comparable with ours.

TECHNIQUE

Our treatment is worked out on the following lines. No selection of cases is made. In all cases complicated by a laryngeal lesion, light treatment is instituted, unless any active treatment of the lungs requires a postponement for some weeks. Fever is not considered a contra-indication. The light treatment is carried out in a well-ventilated hall. The patients are exposed—in the recumbent position—to a series of three carbon-arc lamps, each of 25 amperes. The lamps are used according to the rules laid down at the Finsen Institute. The first exposure is for five or ten minutes, according to the general condition of the patient, and five or ten minutes are added each time until full time is reached, namely, one and a half hours four times or two hours three times a week. After 35–50 light baths there is, as a rule, an interval of one to two months, after which the treatment may be repeated. If any local lesion remains, additional endolaryngeal treatment is given. But such an intervention is not undertaken until the patient is in a favourable condition of immunity.

The fact that no selection is made means that even the severest laryngeal cases are considered suitable. It also means that treatment is undertaken in spite of the most advanced pulmonary lesions. The common fear of an injurious influence from the light baths on the pulmonary disease has in our experience proved to be groundless. We have never noticed the pulmonary disease extend or progress in other ways than one would have expected it to do without light treatment. And, in the great majority of cases, the pulmonary lesions improve satisfactorily during the light treatment. This is not, however, always quite without any action on the pulmonary lesion. In some cases we have observed a more rapid destruction of the affected pulmonary tissue as a result of the light treatment. But it is very doubtful whether this means an aggravation. To our mind it is more natural to explain such an effect as a quickened passage through phases which the lesions must anyhow be expected to pass. Looked upon from this point of view, this phenomenon emphasises strongly the need of combining the light treatment with an earlier collapse therapy of the lung than would be indicated if the light treatment had not been given. Several authors have also anticipated hæmoptysis due to light treatment. We have never seen a hæmoptysis in direct or causative connexion with the treatment. When such a complication occurs, it may be due to the heat of the room, resulting from insufficient ventilation.

When we say that we do not consider fever as a contra-indication, this means that we have never observed any permanent rise of temperature which could rightly be attributed to the light baths. On the contrary, we have often seen fever subside very satisfactorily during the light treatment. It is true that sometimes, especially at the beginning of treatment, the light causes some feverish reaction which may require more caution in the dosage. But we have never observed any permanent ill-effect from the reaction.

Full attention must be paid to all the details of the technical management of the lamps. There are any number of mistakes which may deprive the treatment of more or less of its efficacy. A thorough familiarity with all these details is indispensable, if the light treatment is not to prove—at the best—harmless. A detailed description of the technique would make this article too long. We shall confine ourselves to referring to the publications of the Finsen Institute or, still better, recommending a personal study in a light institute equipped with scrupulous attention to all these details.

Several proposals have been made with a view to projecting artificial light directly into the larynx from elaborately constructed lamps. All such methods should, in our opinion, be abolished, as they are quite out of harmony with the observations on the effect of general light treatment.

When the proper equipment is provided and the right exposure is adhered to, the light baths are found in most cases to provoke a rapid healing of the laryngeal lesion. Naturally, the results are most striking when at the same time the pulmonary lesion

responds well to general treatment or to any active intervention carried out for its arrest. It is no rare observation, however, that the laryngeal affection heals, while the lungs show no improvement or are even getting worse. To our mind this fact must be interpreted as a special effect of light upon the laryngeal tuberculosis. This effect, which is also found in the treatment of lupus and of the majority of cases of surgical tuberculosis, is not yet theoretically understood. So far it is an empirical adjuvant which, for some reason or other, does not apply to internal tuberculosis.

SURGICAL TREATMENT

In the majority of cases light treatment alone is sufficient to heal the laryngeal complication. In a minority of cases the affection is more resistant, or it may heal but for a localised, more advanced focus, against which a local surgical intervention may then be indicated. Such local surgery is, however, to be undertaken with great care. Often even a small operation on the larynx—e.g., a local and superficial cauterisation—may cause a very serious aggravation of the local condition as well as the general state of the patient. J. Bumba (1924) has found out how this condition arises and how it is to be avoided. Many other authors have verified his observations, and it is also the experience of O. S. that the result of endolaryngeal treatment entirely depends on the moment at which it is performed. Any laryngologist will soon find his way in this matter, becoming confident that, if the general condition of the patient is getting worse, any endolaryngeal treatment may have serious consequences. On the other hand, if the general condition is improving the intervention is harmless, and may assure a quicker and more complete healing of the lesion. This experience has led us to choose the moment for endolaryngeal treatment by means of all the criteria by which the intermittent curve of the resistance of a tuberculous organism can be judged. An increase of this resistance is seen by fall of temperature, gain in weight, and, more surely, by a steady fall in the blood sedimentation test and, best of all, by the blood picture, in which a serial Arneth's count shows a movement from left to right. Only when all these criteria are propitious should the endolaryngeal operation be performed. The light treatment in itself seems to be one of the most potent factors in provoking such a favourable rise of the patient's immunity.

Besides the treatment mentioned above, voice rest has been prescribed in some cases, complete silence in a few. But as long as the cough persists, voice rest is of comparative little importance. It seems to us more necessary to relieve the patient's cough by suitable treatment of his lungs than to prescribe a voice rest, the maintenance of which often causes him great suffering.

RESULTS

The results obtained are shown in the accompanying four tables. Tables I. and II. show the results obtained by O. S. with poor out-patients at the Finsen Institute, Copenhagen. The percentage of healing of the larynx reaches 59·4, although 215 out of the 251 patients had ulcerations, and of these more than half had exoglottic affections. The ulcerative cases, taken alone, show a percentage of healing of 56.

In 12 cases a relapse was observed. They were all given further treatment and healing again occurred in 11. It has been impossible to trace all these patients, as many of them belonged to distant rural areas. Table II. shows that 31 patients have not been controlled after the treatment was completed. The rest of the patients are classified according to the length of time control examinations have shown no relapse.

TABLE I.—*Laryngeal Results in 251 Out-patients Treated by Light. (Finsen Institute.)*

—	Ulcerative lesion.	Infiltrative lesion.	Total.
Larynx—			
Healed	121	28	149 (59·4 %)
Apparently healed ..	5	1	6
Improved	3	0	3
Stationary	1	0	1
Worse	1	0	1
Patient died	9	1	10
Treatment interrupted—			
Improved .. 48			
Stationary .. 13	75	6	81
Worse 14			
—	215	36	251

TABLE II.—*Time of Observation for 149 Patients with a Healed Laryngeal Lesion. (Finsen Institute.)*

No later observation ..	31	4– 5 years	10
3 months or less ..	12	5– 6 ,, ...	8
3– 6 months	8	6– 7 ,, ...	4
6–12 ,, ...	9	7– 8 ,, ...	3
12–18 ,, ...	15	8– 9 ,, ...	5
18–24 ,, ...	7	9–10 ,, or more ..	11
2– 3 years	18		149
3– 4 ,, ...	8		

Tables III. and IV. show the results obtained during our coöperation at Vejlefjord Sanatorium. During six years (1926–1932) 149 patients have been discharged, or have died, after treatment for laryngeal complications. In this material the percentage of healing, excluding the patients who died in the sanatorium with a healed larynx, is 80·5. Of the 120 "healed" cases, 33 had only had infiltrations, 87 ulcerations. Among 120 patients with a healed larynx, 4 have so far shown a relapse. The average number of light baths has been 60. Table IV. shows that 18 patients have not been controlled afterwards. The remaining 102 patients are classified according to the length of time during which after-control has shown no relapse.

TABLE III.—*Laryngeal Results on Discharge of 149 Patients. (Vejlefjord.)*

—	Ulcerative lesion.	Infiltrative lesion.	Total.
Larynx—			
Healed	87	33	120 (80·5 %)
Improved	13	2	15
Stationary	3	0	3
Worse	4	1	5
Patient died	5	1	6
Total	112	37	149

TABLE IV.—*Time of Observation for 120 Patients with a Healed Laryngeal Lesion. (Vejlefjord.)*

No later observation ..	18	3–4 years	14
Less than 6 months ..	16	4–5 ,, ...	3
6–12 months	23	5 years or more	2
1– 2 years	25		120
2– 3 ,, ...	19		

It is self-evident that a number of the patients with a healed laryngeal lesion succumbed later on to the pulmonary lesion or died from other complications or intercurrent diseases. Exact statistics in this respect have not been available in the particular material here represented.

The above figures seem to us to suggest that the prognosis of a laryngeal lesion as a complication of phthisis is no longer to be considered so gloomy as has hitherto been supposed. A great majority of these patients can be helped when those lines are followed

on which light treatment and endolaryngeal intervention by an experienced laryngologist are combined with a sanatorium régime, including all the methods of active lung treatment at our disposal.

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"ACUTE YELLOW ATROPHY" IN PULMONARY TUBERCULOSIS

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A WOMAN, aged 27, was admitted to the Cheshire Joint Sanatorium on March 15th, 1933, with a tuberculous lesion involving the upper half of the left lung and a few deposits in the upper third of the right lung. After a period of sanatorium treatment a left artificial pneumothorax was unsuccessfully attempted, followed by a left scalenectomy with removal of the head of the first rib and resection of the phrenic nerve. The patient continued to make satisfactory progress until Sept. 17th.

She then complained of indefinite indigestion and loss of appetite which continued for three days with evening temperature ranging from 99° to 100° F. On the 20th slight jaundice ensued and this became marked on the 24th with temperature of 102° F. and nausea which was treated by light fat-free diet, together with the administration of pulv. hydrarg. cum crete and mist. alba. From Sept. 25th to 30th these symptoms persisted with the addition of several attacks of vomiting of undigested food. On the 28th an urticarial body rash developed and on the 29th a slight staining of sputum with blood occurred. The evening temperature remained elevated, ranging from 101° to 102° F. Calomel and mag. sulph. were substituted for mist. alba and hydrarg. cum crete. Fluids such as Bovril and lemon with glucose were given freely.

On Oct. 1st the condition remained unchanged except that evening temperatures fell to 99° and the motions were relaxed. On the 2nd evening temperature fell to 98° F. and restlessness and strangeness of manner were now additional features. The patient was continually trying to get out of bed, nourishment was refused, and rectal feeding became necessary. On the 3rd her condition was much worse: the temperature was now 97° F., and the patient very drowsy and comatose throughout the day, but noisy and restless when receiving attention. Incontinence of urine and fæces with non-retention of rectal feeds supervened, with Cheyne-Stokes breathing, muscular rigidity, and an extensor plantar reflex on both sides; the pupils reacted sluggishly to light but were equal in size. Lumbar puncture was performed. The fluid was straw-coloured and only slightly under pressure, and the cytological and chemical examinations were normal. The blood non-protein nitrogen and blood-sugar were also normal.

The patient died at 10 P.M. on Oct. 3rd. At the post-mortem the following were the findings of significance:—

Lung and pleura.—Right: pleura normal except for a few apical adhesions and a few petechial hæmorrhages; upper third of lung showed several small caseating areas with considerable fibrosis; base congested and œdematous. Left: pleura thickened with numerous thick fleshy adhesions in upper third and fine adhesions throughout; lung showed caseating tubercles with some fibrosis in upper half with an uncontrolled cavity under the clavicle; base œdematous and congested.

Diaphragm.—Left half was higher than right half and presented the appearance of a fibrous sheet with little muscle tissue.

Heart and pericardium.—Numerous hæmorrhages into the pericardium and cardiac walls, especially about the origin of the great vessels.

Liver.—Small, very flabby, and on section structureless, the whole presenting the appearance of necrosis.

Gall-bladder.—Normal. No evidence of obstruction either of the common duct or of the cystic duct.

Spleen.—Normal in size, very flabby. On section congested.

Kidney.—Capsules stripped easily and on section the kidney substance was bile-stained, otherwise normal.

Intestines and mesentery.—Numerous small hæmorrhages into the mesentery and a few in the walls of the small intestine and parietal peritoneum.

Brain and meninges.—Occasional small hæmorrhages throughout the substance of the brain. No evidence of increased intracranial pressure.

The following report was received on the microscopical examination of the liver and spleen:—

Liver.—Entire necrosis of liver cells with no fibrosis tissue and only a small amount of fat pointing to an acute condition with no evidence of repair. Bile-ducts with a surrounding zone of small round cells were very numerous.

Spleen.—Section did not show any marked pathological change.

The diagnosis is certainly that of "acute yellow atrophy," but the origin of the toxins causing the condition is still obscure.

We are reporting the present case for the following three reasons: (1) The condition is rare and the origin of the toxins causing it in this patient are unknown. So far as we know it is not associated with pulmonary tuberculosis. (2) Severe liver changes, falling short however of this extreme condition, have been reported in cases of pulmonary tuberculosis in which death has followed the administration of Sanocrysin, and these changes were thought to be due to the toxic actions of this drug. A feature of this case is that sanocrysin was never given. (3) To point out that pulmonary tuberculosis is not the only cause of death in a sanatorium.

We are indebted to Dr. Peter W. Edwards, medical superintendent of the Cheshire Joint Sanatorium, for permission to report this case and to Dr. G. Stewart Smith, assistant pathologist to the Manchester Corporation, for permission to include his report on the microscopical sections.

CŒLIAC DISEASE IN AN ADULT

TREATED WITH SUGARLESS MILK, BANANAS, AND MEAT

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THE successful alleviation of a severe and chronic illness in an elderly patient gives importance to the methods used.

CASE-HISTORY

A single woman of 54, born in London, had from earliest recollections attacks of diarrhœa with large "fermented" stools, distension, flatulence, and occasionally a sore tongue. At 19, in the West Indies, malaria was followed by indigestion and light-coloured stools. Improvement took place and, except for a period at the age of 28 when similar attacks were severe and when there was loss of weight and strength, anæmia, and amenorrhœa, health remained well enough for a normal life to be led until 1917. At that time, aged 37, bowel symptoms became worse, weight was lost to emaciation, and tetany appeared for the first time. Treatment by calomel and milk diet failed.

FIRST ADMISSION TO HOSPITAL

The patient was then admitted to Duff House, Banff. She was a small emaciated (5 st. 12½ lb.), active, courageous woman. There were ulcers in the mouth, and the rectum was sore. Motions were light, semi-solid, about twice the normal bulk. There was a moderate deficiency in the absorption of fat, about 20 per cent. of that given appearing in the fæces (normal 5 to 10 per cent.). The protein loss (14 per cent.) was also rather above the normal. Her systolic blood pressure was 100 mm. Hg. The hæmoglobin was 66 per cent. The red cells numbered 4,500,000. The gastric juice was subacid with a trace of free HCl. A barium examination showed a large, but not enormous, colon, with fair segmentation.

A diagnosis was made of "sprue or cœliac disease dating from infancy." In to-day's nomenclature the case would be labelled cœliac disease with some physical infantilism. Mentally the patient was well developed and well equipped.

Various diets and forms of treatment, including lavage of the stomach and intestines, were tried for some weeks without avail. Intestinal douching relieved tetany for the time. A diet of meat only was then prescribed. On this régime improvement began. The tetany and the rectal soreness lessened and vanished. The motions became less bulky, the blood and weight improved. Early attempts to add carbohydrate led to loss of weight and recurrence of soreness of the tongue and rectum; but after several months, when fruit was well borne, a little starchy food, usually biscuits, was tolerated. On discharge, after 11 months, there were no symptoms and the weight had risen to 7½ st. The case was published by Dr. P. C. Conran.[1]

PROGRESS OF CASE

From 1927 to 1932 the patient kept well on the whole—beef "cakes," or other meat, with fruit and a little carbohydrate formed the basis of the diet. She had, however, several relapses during which she was treated by various physicians with differing measures, including hydrochloric acid, the reduction of fat, and the use of glucose. The reduction of fat was doubtless recommended because the stools were fatty. When, however, the total amount of fat taken and lost was estimated, as had been done at Banff and was done later again at Ruthin, it was found that the major part—namely, 70 to 80 per cent. of that taken—was assimilated. The omission of this foodstuff from the diet led naturally, therefore, to severer wasting, nor did it lead to improvement in symptoms.

SECOND ADMISSION TO HOSPITAL

Influenza in March, 1932, was followed by a severe relapse, and the patient was admitted to Ruthin Castle in the following August. She then weighed 5 st. 11 lb. and was too weak to walk more than a few yards; her complexion was sallow and her mucous membranes pale. There was extensive œdema of the legs and beak-shaped clubbing of the fingers, with the skin of the palms pink and glazed. Knee- and ankle-jerks were absent. Her blood pressure was 115/85, her pulse rapid, and her heart sounds feeble with a systolic murmur at the apex. She had only one tooth left; her tongue was clean; her abdomen was grossly distended and doughy, there was evidence of free fluid. A fractional test-meal showed no free acid or pepsin. The hæmoglobin was 58 per cent., and there were 3,200,000 red cells; the colour-index was 0·9 and the blood calcium 9·2 mg. per 100 c.cm. The motions were large and pale; no mucus, pus, or blood was found; fat constituted 40·8 per cent. of the dry fæces and was composed of neutral fat 6 per cent., fatty acids 12 per cent., and soaps 81 per cent. There was no starch but occasional meat fragments; the tryptic value was 2 units (normal 5–10). The urine had a specific gravity of 1021, a trace of albumin, a few red blood-cells, and a diastatic value of 3 units (normal 10–30). The urea-concentration test showed normal secreting power. After a barium meal the second part of the duodenum appeared kinked; there was moderate dilatation of the transverse colon, and the sigmoid was redundant. Radiography of the bones showed atrophy of the articulations of knees and feet. The patient was now less able to consume the quantity of meat she had formerly taken.

An attempt was again made to improve nutrition by adding to the diet first fruit and then carbohydrate in the form of small measured amounts of ground rice and bread. This was followed by diarrhœa, as many as eight motions a day of a weight up to 2500–3000 g. The stools at this time contained excess of fats and undigested meat residues, but never any starch. Weakness increased, œdema became more extensive, and the blood pressure fell to 70 systolic; also cramps returned and persisted, culminating in tetanic convulsions. Reducing the fat in the diet led to no improvement in the stools or in symptoms.

THE SUCCESSFUL DIET

At this point the patient was put by Dr. E. I. Spriggs upon sugar-free milk (Howland[2]), with bananas (Haas), and later meats, a diet similar to that recently described by S. V. Haas.[3] Rapid improvement followed.

The carbohydrate-free milk which forms the basis of the diet was prepared by Mr. A. J. Leigh, B.Sc., and Miss Davidson, the diet sister, by modification of a method described by Hutchison.[4] The recipe is given below. About four or five pints of this milk may be given a day, and this has enough caloric value (350 calories per pint) to meet basal requirements. That quantity can readily be taken provided it is given constantly in small amounts throughout the day. It may be flavoured with coffee, tea, or Bovril to avoid monotony. Bananas formed an important part of the food; they were increased up to as many as 12 a day. The patient was hungry during the first week of the diet and the quantities were increased steadily.

The diet was next supplemented by 3 oz. of minced lean beef three times a day. Carbohydrate was avoided altogether, except some glucose and that contained in certain fruits—e.g., the bananas, either fresh or as cakes or scones made from banana flour, and, later, oranges and apples. After the motions and bowels were normal the following vegetables were given in small amounts: carrots, peas, French beans, spinach, celery, lettuce. The diet contains adequate vitamins except perhaps D, which was supplied by Radiostol. Cod-liver oil was badly borne. Such small amounts of ordinary sugar or starch as are contained in a sweet or a small piece of cake or bread are reported by Haas to be enough to cause relapse.

Ten to twenty drops of dilute hydrochloric acid, in fruit juice or water, was given with the meals, and Pankreon, one or two tablets, after them. For tetany, calcium chloride was given in grs. 15 doses three times a day, and, later, when the signs of latent tetany had subsided, grs. 5 of calcium lactate three times a day. It is probably best to start with the chloride and continue with it as long as there appears to be any danger of the cramp pains recurring. A cachet of grs. 20 of reduced iron was taken three times a day: on this a stage of constipation may be reached which in the present case occurred after a fortnight; it was relieved by liquid paraffin and the cultivation of a regular daily habit. An occasional intestinal douche was found to relieve abdominal distension.

The following was a typical day's diet after the patient's tolerance for the added foods had been established:—

8.30 A.M.—Cold ham, 3 oz.; two bananas; one apple; special milk, 13 oz.

11 A.M.—Four bananas; special milk, 13 oz.

1.20 P.M.—Beef cake, 4 oz.; rabbit or kidneys; carrots, 2½ oz.; two baked bananas; one baked apple; orange juice, 7 oz., with glucose, 1½ oz.; special milk, 13 oz.

4.15 P.M.—Special milk, 13 oz.; four bananas.

7.30 P.M.—Beef cake, 4 oz.; rabbit or kidneys; cold

tongue, 3 oz.; carrots, 2½ oz.; one baked apple; two baked bananas; special milk, 13 oz.

For night.—Four bananas; one apple; special milk, 13 oz.

An absorption test was carried out on this diet, which contained 145 g. of protein, 185 g. of carbohydrate, and 174 g. of fat, the caloric value being about 3100 (i.e., calories per kg. body-weight 90, per lb. 40) including 90 calories from hemicellulose. The percentages absorbed were carbohydrate 99 per cent. and fat 84 per cent. The nitrogen positive balance was 4·3 g. The test was repeated six months later on the same diet and the percentages then absorbed were: carbohydrate nearly 100 per cent., fat 90 per cent., with still a large nitrogen positive balance.

The sugar-free milk is prepared as follows:—

To make half a gallon (4 pints) take gelatin, 4 sheets; Callard's Prolacto flour, 1 packet (2 oz.); liquor potassæ (half strength), 2½ oz.; thick cream (that can just be poured), 7 oz.; Callard's Saccharin Elixir, 15 drops. Place the gelatin in an enamelled saucepan, pour on about half a pint of boiling water, and stir until dissolved. To the prolacto flour in another saucepan add about ½ pint of cold water and stir until mixed. Add the liquor potassæ, stirring all the time, and pour the gelatin solution on to this. Transfer, without delay, to a clean, stoppered bottle (e.g., a Winchester flask) marked at the 80 oz. (i.e. 4 pint) level, using a funnel. Add the cream and then cold water to the 4-pint mark. Lastly add the saccharin elixir and shake. Keep in a cool place and shake well every time before use.

The accompanying Table shows the condition of the patient immediately before treatment and six months later:

—	NOVEMBER, 1932.	JUNE, 1933.
General condition..	Weak; hardly able to walk.	Enjoys gentle walks without fatigue.
Weight	5 st. 1½ lb.	6 st. 12 lb.
Rheumatic pains and cramps ..	Severe.	Slight.
Abdominal pain and distension ..	Severe.	Much improved.
Œdema	Extensive; free fluid in abdomen.	None.
Motions	Up to 7 a day.	1 or 2 a day.
Weight	Up to 2600 g. a day.	200–250 g. a day.
Fat in dry fæces*	40 %	43·4 %
Muscle-fibres and undigested food	Large quantities.	None.
Blood—		
Hb.	58 %	61 %
Red cells ..	3,200,000	4,100,000
C.I.	0·9	0·74
Calcium	9·2 mg. per 100 c.cm.	10·2 mg. per 100 c.cm.
Urine—albumin ..	Present.	Trace once.
Pulse-rate	Up to 110 at rest.	80–90 at rest.
Blood pressure ..	60–80 systolic.	95–70

* Proportion of ingested fat absorbed.

DISCUSSION

In the diet prescribed the ordinary forms of carbohydrate are absent. Although such carbohydrates themselves are absorbed and were at no time found undigested in the fæces, they appear to arouse the symptoms of cœliac disease, including interference with calcium metabolism and resulting tetany, and impairment of the utilisation of other foodstuffs. Haas, whose paper is based on the experience of 75 cases, states that bananas contain a ferment which hydrolyses starch and inverts cane sugar, also all vitamins in adequate amount except perhaps D; and that their administration changes the intestinal flora "from a Gram-negative to a Gram-positive aciduric type" and does not produce intestinal fermentation. Some or all of these properties may explain why the banana is so helpful in cœliac disease. The important fact is that its carbohydrate can be used, it seems indefinitely, without giving rise to the symptoms of the complaint, which is not the case with other carbohydrates; and that with the banana the proportion of carbohydrate, protein, and fat in such a diet as is described above can be balanced satisfactorily and utilised. The diet when established has a high fat content, most of which was absorbed. In a research upon another case passing large fatty stools, it was found[5] that milk fat was more easily absorbed than other forms of fat. When this patient recovered 15 years ago on a meat diet it was then possible to use ordinary general foods, beginning with bread and butter in moderation. The same is found in other cases of this disease on the régime here described. It is important, however, not to try such addition until after at least six months of health on the special diet.

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A CONCENTRATION METHOD FOR THE BACTERIOLOGICAL EXAMINATION OF WATER

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THE apparatus to be described has been successfully employed in the department of bacteriology at Sheffield for about a year in the routine bacteriological examination of water. It is merely an adaptation of the old method of using Seitz filters for filtration of bulk samples of water. Its essential features are that definite amounts of the sample can be rapidly measured and filtered with aseptic precautions.

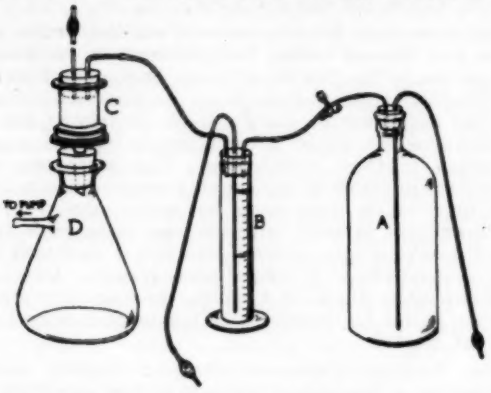
THE APPARATUS

The Winchester bottle (A) with a suitable ground-glass stopper is sterilised by dry heat, the stopper being fitted with a paper cap. During sterilisation the stopper is left loose in the neck of the bottle; but, when sterilisation is completed and the hot-air oven with its contents are cool, it is pushed home and the skirt of the paper cap is tied round the neck of the bottle. This is issued to the user with detailed instructions.

On arrival at the laboratory the smaller amounts are first removed for both total and differential bacterial counts (vide Eyre's "Bacteriological Technique," London, 3rd ed., p. 497 et seq.)—i.e., in the examination for *Bacillus coli* up to the 50 c.cm. and in that for *B. welchii* up to the 10 c.cm. amount. The Winchester is then fixed to the sterilised filtration apparatus. This is done by removing the glass stopper and substituting for it a rubber bung fitted with two pieces of glass tubing. The one which leads via a piece of rubber tubing, with clip attached, to the measuring cylinder, just passes through the bung; the other which passes to the bottom of the cylinder is the air-pressure adjusting tube. The latter, just external to the rubber bung, is bent on itself, and its external limb is slightly longer than its internal. Near its external extremity it has a cotton-wool bacterial filter.

Two important points should be noted in fitting the Winchester: (1) the rubber bung should be tied in; (2) much annoyance is saved if, before the Winchester is sterilised, it is tested to see if the rubber bung of the apparatus fits it.

The measuring cylinder (B) is of 250 c.cm. capacity. A rubber bung fits its mouth and is pierced by three pieces of glass tubing. One of these is connected to the Winchester as above described, and another to the Seitz filter by means of rubber tubing. Both just pass through the bung. The third piece of glass tubing is for pressure-



adjusting purposes, and is similar in construction to that attached to the Winchester.

The Seitz filter (C) is one of the old "screw-on" pattern, size 6—the new type exposes externally the rim of the filter film and is thus unsuitable. Three such filters fitted with "Seitz E K special sterilising" filtering films are necessary for each water examination as carried out in this laboratory. The upper surface of one of these films is divided into two equal parts by means of a pencil mark, and through this film one litre of water is drawn. The upper surfaces of the other two films are divided into eight equal parts with pencil lines; through one 800 c.cm. and through the other 200 c.cm. of the sample are drawn.

Each filter in turn is attached to the apparatus. The top of the filter is fitted with a rubber bung just pierced by two pieces of glass tubing. One of these is connected by rubber tubing with the measuring cylinder as above described, whilst the other is a pressure-adjusting tube. This tube projects upwards to a height greater than the level of the bottom of the measuring cylinder when it is in its inverted position. Its external extremity is controlled by means of a cotton-wool bacterial filter. The outlet of the filter is fitted to a filtration flask (D), which is connected with a Geissler's vacuum pump. It is important that the filter film should be absolutely horizontal to ensure even filtration, and this can be easily done with the aid of a spirit level.

Before use the apparatus, except the filtration flask, is sterilised—the measuring cylinder being plugged with cotton-wool and sterilised in the hot air oven, whilst the rest of the apparatus is sterilised in the autoclave after first being wrapped up in stout paper. The whole apparatus must, of course, be assembled with aseptic precautions.

METHOD OF USE

The Winchester is inverted and 200 c.cm. of the sample are run into the measuring cylinder. The rubber tube between the two is clipped and then the measuring cylinder is inverted and the Geissler's pump started. When all the water has been drawn through, the filter is removed and the next one fitted. Through this, 800 c.cm. of the sample are drawn by alternately filling and emptying the measuring cylinder. This filter is then removed and the third one fitted in its place. Through this, one litre of water is passed.

Each filter film is removed aseptically immediately after filtration and placed in a sterile Petri dish. With sterile scissors and forceps the appropriate amounts are cut off and snipped into tubes or flasks containing suitable media. 6 × 1 in. tubes containing 30–40 c.cm. of the medium are used for examinations in which not more than a quarter of the filter film is used. Where more of the film than this is needed, flasks of a capacity of 150 c.cm. and containing 80 c.cm. of medium are employed. Thus, in the above-mentioned filtration experiment, one can put up cultures representing 25, 50, 100, 200, and 500 c.cm. of the sample for examination for the presence of *B. welchii* as well as cultures representing 100, 200, and 500 c.cm. for the investigation of the *B. coli* and streptococcus content.

This method can, of course, be varied to suit individual requirements. The further treatment of the inoculated tubes and flasks proceeds along the usual approved lines.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF TROPICAL DISEASES AND PARASITOLOGY

AT a meeting of this section on Jan. 11th, with Dr. H. S. STANNUS, the president, in the chair, a paper on some aspects of

Intestinal Diseases of European Children in the Tropics

was read by Dr. PHILIP MANSON-BAHR. Bacillary dysentery, he said, was the most formidable of these and its correct diagnosis was of great importance. To regard every case of dysentery in a small child as necessarily amœbic, and subject the patient to endless emetine injections was iniquitous. Bacillary dysentery was usually more acute in European children than in native subjects, and in those under five years of age the signs of toxic absorption came on more suddenly than in adults. The attack might be ushered in by convulsions, and the child might die in coma before the dysenteric symptoms proper were manifest. Most of these cases were due to organisms of the Flexner group, but there was evidence that Sonne's bacillus played a great part in the enteritis of children in the tropics. Two varieties of Sonne nfection could be recognised: one approximated to an acute Flexner dysentery, with blood and mucus in the stools, while in the other there were acute toxic symptoms resembling those caused by salmonella infections, and death might occur rapidly. In the milder types the stools were loose and green, the abdomen at this period being distended.

Since bacillary dysentery was more of a toxic disease in children than in adults, and the young nervous system was particularly liable to attack, it demanded energetic treatment, especially of the toxæmia. Antidysenteric serum was considered more useful in childhood than later, but it must be given in adequate quantity and early. Milky foods should be withheld, but plenty of fluid in the form of albumin water or barley water should be given. Cocaine or morphia suppositories eased the abdominal pain. In dehydrated patients deep subcutaneous or intravenous injections of normal saline with 5 per cent. glucose were indicated. The modern sera were more efficacious than older ones. The idea underlying the serum administration was to minimise coagulation necrosis in the intestinal mucosa. The four chief indications for it were: (1) signs of toxic absorption; (2) more than twelve stools in 24 hours, with blood content; (3) a rapid rise in pulse-rate, with corresponding temperature rise; (4) an acute stage, with bloody stools and pain, lasting more than three or four days without signs of subsiding.

Amœbiasis might be acquired at any age, but in European children, contrary to common opinion, it was rare. Amœbic abscess of liver was likewise rare among them. These facts required emphasis because of the prevailing custom of injecting emetine as soon as symptoms of dysentery appeared. In small children, especially, emetine injections were toxic.

Giardiasis was very common in children—three times as common as in adults. When the stools were liquid and diarrhœic *Giardia intestinalis* was found in active state and in large numbers; in the chronic stage the stools might resemble those of cœliac disease. The latter was not at all rare in European children, especially in Malaya and India, and he associated the defective fat-assimilation and mal-digestion of carbohydrates with the excitable tempers many of them manifest. It might be a sequel to bacillary dysentery in infancy. The youngest case of sprue he had seen was in a boy aged 13, in Ceylon, but Reginald Miller had described a case in a child of 11½.

Polypus might produce many dysenteric symptoms, including tenesmus and the appearance of blood in the stools; a history of recurrent attacks over a considerable period, without noticeable impairment of general health, favoured this diagnosis. Intussusception might occur in infants as a complication of acute bacillary dysentery, or might be quite independent. It could easily be mistaken for acute bacillary dysentery. Colitis, other than dysenteric, might occur in the form of acute idiopathic ulceration of the colon. It ran an acute course, with pyrexia, toxæmia, and anæmia. Also, in tropical children there was a form of mucous colitis—nearly always the sequel to a previous attack of bacillary dysentery. Tuberculous ulceration of the colon or of the large intestine was far commoner in children from the tropics, especially those who had suffered from some form of dysentery, than was usually supposed. He thought that some forms of so-called ulcerative colitis were of tuberculous origin, though the bacilli might be difficult to detect in a stool containing blood and mucus.

Intestinal disturbances of dietetic origin were very common in the tropics among European children. Sometimes, also, the food came largely from tins and might be very deficient in vitamins. Of tape-worm infections, *Tænia saginata* was not only the most common but the most difficult to dislodge. He had encountered only one case of *T. solium*, and in that case the worm was dislodged complete, with head. *Ascaris lumbricoides* infection was often encountered in children from Hong-Kong, Singapore, and Shanghai. There might be no symptoms, but he had seen it cause urticaria. Ankylostoma was a cause of much chronic ill-health and must always be borne in mind. He was suspicious of it when he saw a child with a sallow complexion and listlessness. The fæces must be examined by the Clayton Lane floatation method. Oxyuris infection was common in the tropics among children, and was difficult to eradicate. He had diagnosed massive oxyuriasis by means of a sigmoidoscopic examination. He obtained the best results by giving ℥ 30 carbon tetrachloride, followed by rectal injection of 1 in 100 quassia.

DISCUSSION

Dr. A. MAITLAND-JONES said that in the last five years 13 cases of dysentery had been admitted to the London Hospital, and 7 of them were in children. He considered that bacillary dysentery was rare in this country, and usually mild. The condition of none of the seven children caused anxiety. Not long ago 20 cases of Sonne dysentery occurred in a children's hospital, with 2 deaths; one of the children that died had cœliac disease, and the other was very wasted on admission. He thought that usually young children were overtreated for threadworms, which seldom did any real harm.

Dr. REGINALD MILLER spoke of emetine poisoning as a new disease calling for treatment in children; it was due to the practice of giving large quantities of emetine for supposed dysentery. He pointed out that a child might not be passing stools containing blood and mucus but might nevertheless be spreading an infection to those about him. The death-rate of dysentery in wards in this country was practically nil. He objected to treatment by daily salines. He believed that lamblia infection was responsible for much loss of weight in those who had it, and that in the young child it interfered with growth. Oxyuris did not cause illness in a child. In cases of cœliac disease it was impossible to be too strict in reducing the fat intake.

Dr. DONALD PATERSON thought that a good proportion of the cases of Sonne dysentery seen in this country owed their origin to Scandinavia, where it was common. Tape-worm invasion in children he did not regard with any anxiety.

Colonel F. P. MACKIE said that in acute cases it was a mistake to wait for and depend upon the bacteriological diagnosis, since in the meantime the patient would either die or get well. The Flexner bacillus was not so toxic as the Shiga. He did not regard lamblia as a pathogenic infection at all, nor had he seen specimens in which that organism penetrated the mucous membrane.

Sir MALCOLM WATSON remarked that if all who passed blood and mucus per rectum were to be regarded as having dysentery, there were few European children in the tropics who had not had it. When feverish symptoms occurred in suspicious cases, the condition was usually cured in 24 hours by cutting down food and giving purgatives. As to the age at which children of European parentage should be taken to the temperate zone, he would not hesitate to leave a child in the tropics until he was ten years old.

Dr. LEONARD FINDLAY referred to the geographical variation in the clinical picture of disease. He regarded bacillary dysentery as a very characteristic disease—so characteristic that it was unnecessary to resort to a bacteriological examination. It was sudden of onset, though it might follow chronic diarrhœa, and the signs were fever, toxæmia, and the frequent passage of typical dysenteric stools.

Mr. H. W. S. WRIGHT said he had seen in China epidemics of bacillary dysentery in which half the patients died. He agreed with what had been said about emetine, whose mode of action was ill understood.

The PRESIDENT said that in ascaris infection, if the worm was in the bile-duct and was sealed off, diagnosis would be difficult, especially if one relied on finding the ova in the fæces. Oxyuris infection he thought was not so common nowadays as formerly. He recalled that two days ago Sir William Willcox had uttered a warning concerning the use of carbon tetrachloride, and had described it as a dangerous drug.

Dr. MANSON-BAHR, in reply, said he was not aware of any patient within his ambit who had died in consequence of having carbon tetrachloride.

REVIEWS AND NOTICES OF BOOKS

Maternal Mortality in New York City

By the New York Academy of Medicine Committee on Public Relations, RANSOM S. HOOKER, M.D., F.A.C.S., Director of the Study. New York: The Commonwealth Fund. London: Humphrey Milford, Oxford University Press. 1933. Pp. 290. 8s. 6d.

IN America, as here, there is great concern about the static maternal mortality-rate, but the problem is attacked in a different manner. There reliance seems to be placed on non-official rather than departmental effort, and this report provides a striking instance of what can be done by coöperative study of the mortality in a single large city. It comes from a committee of the New York Academy of Medicine set up to review every puerperal death in the city from Jan. 1st, 1930, to the end of 1932. With the financial aid of the Commonwealth Fund and the professional assistance of a group of prominent obstetricians, every maternity death during those three years was investigated within a week of its occurrence, information being obtained at first hand by interviewing all those who had been in attendance on the patient. The investigators were given official standing by the Department of Health, thus allowing them direct access to the records of all those cases in which the confinement had taken place in hospital. Every month the jury of expert obstetricians was empanelled to determine the cause of death in each instance and, after hearing the evidence, to return a verdict of "preventable" or "non-preventable." Of the 2041 deaths reviewed, 1343, or about two-thirds, were classed as preventable and ascribed to lack of skill or faulty judgment of medical practitioner, incompetence of midwife, or poor hospital administration, and the remainder to negligence, lack of education of, or failure to coöperate by, the prospective mother.

Many of the conclusions reached are such as would be expected, but the unexpected are probably of greater interest. It has apparently come as somewhat of a shock to the committee, that "the great increase in the hospitalisation of the normal parturient has failed to bring the hoped-for reduction in puerperal morbidity and mortality." Under 30 per cent. of the deliveries investigated took place in the home with a rate of but 1·9 as compared with 4·5 per 1000 live births in hospitals, too wide a difference to be explained wholly by the reference or transference of serious cases to hospital. The recommendation is that "the present attitude towards home confinement requires re-examination, and a programme looking toward an increase in the practice of domiciliary obstetrics deserves careful investigation." Another conclusion reached must hasten the slow conversion of the U.S.A. to the need for a properly trained and supervised corps of midwives, for it is that "contrary to the generally accepted opinion, the midwife is an acceptable attendant for properly selected cases," and that the results of her practice "are as good as those attained by the physician under what are regarded as comparable circumstances and for comparable cases." The recommendation made is that the medical profession "must regard her as an ally in the effort to reduce the morbidity and mortality associated with childbearing."

These examples will serve to indicate the open-minded and judicial character of this report. It exhibits greater courage than our Departmental Committee in stressing the need for educating the lay public and combating the ever-increasing call for instrumental delivery. The profession must initiate propaganda to convince the public that shorter labour involves increased risk for both mother and baby.

Edward Wilson of the Antarctic

By GEORGE SEAVER, M.A. Oxf., B.D. Lond. London: George Murray. 1933. Pp. 299. 10s. 6d.

THE life of Edward Adrian Wilson makes a truly moving book; we have here a record of consistent goodness. From his bright childhood and busy school days to his tragic death in a tent beyond the Great Ice Barrier of the Antarctic, through a dramatic range of personal experiences, Wilson was always good—good with no sanctimoniousness and no assumptions of a higher plane. He was a naturalist who loved nature but did not love collecting things; he took kindly to sport but sacrificed in its pursuit no time which he considered should be given to work; he had the makings of a great artist but preferred a career of service for others; physically not strong, and for a period definitely sick, he fought down his disabilities; he carried out the Christian creed to a point comparable almost with the fanaticism of a medieval devotee, and yet, so resolutely modest was he, that his deep religious sense remained unknown even to intimate friends. By the letters, journals, and family memoir from which the material for this book has been selected Wilson's character can be gauged—we see alike his unselfishness and loyalty, and the powers of sympathy which made him throughout remarkable in the capacity of peacemaker; he made the kind of peace which demands no sacrifice of principle but a generous comprehension of the aims of others.

Wilson, who received his professional training at St. George's Hospital and at Cambridge, where he was a member of Caius College, graduated in medicine in 1900, and almost immediately applied for a post on the National Antarctic Expedition under Commander R. F. Scott. On the voyage of the *Discovery* he proved himself a great naturalist, a tireless worker, and a capable doctor. During the four years which that expedition lasted both the facts and the written testimony of his comrades show the extreme value of his coöperation. On return to England a period of close scientific work in connexion with the Grouse Commission followed, where his combination of artist and man of science was displayed in the report of an inquiry of which Wilson wrote a third and supplied all the illustrations. He proved himself one to whom the career of the original investigator along honourable and possibly remunerative lines was open, but to follow it would not satisfy his eager spirit. Thus he came in 1910 to join Scott in the *Terra Nova*.

About a quarter of the memoir tells with much poignant detail the story of the final expedition on which Wilson started as chief of the scientific staff upon Scott's last tragic adventure. From the first winter quarters of the *Terra Nova* Scott writes of Wilson: "He stands very high in the scale of human beings, how high I scarcely knew till the experience of the past few months. There is no member of our party so universally esteemed." And as we read the record in Scott's recovered journals we realise how fully the eulogy was deserved. No attempt need be made to summarise the closing scenes. To many the story is familiar, and to all, whether they do or do not know it, its narration in these pages can be commended. In spite of himself, and at variance with every thought and act of his life, Wilson appears as a typical hero.

The book contains reproductions in black and white

and in colour of many of Wilson's drawings made often in circumstances of the greatest possible discomfort or danger. He is displayed as a delicate, accurate, and imaginative artist; the beauty of scenes and objects of all sorts comes out in his translations. As a book illustrator he would have been in the first rank, and as an original artist, with more opportunities for academic study, he would probably have gone as far. Mr. Apsley Cherry-Garrard's introduction should be read, for it summarises, in affectionate but never in sentimental terms, the impressions of Wilson which will be derived from this memoir.

A Manual of Diseases of the Nose, Throat, and Ear

Seventh edition. By E. B. GLEASON, M.D., LL.D., Professor of Otology, Medical Chirurgical College, University of Pennsylvania. London: W. B. Saunders Co., Ltd. 1933. Pp. 651. 21*s*.

THIS well-known manual, first published in 1907, is designed to supply students and practitioners with the essential facts of these specialties in concise form. Considerable new material has been added to this edition, and sufficient has been eliminated to avoid much increase in size, for the book has been expanded by only 34 pages. The pruning has not sufficed to eliminate some unnecessary historical matter and descriptions of superseded methods, and many of the illustrations have an old-fashioned appearance. The spurs or projections which form the apex of a deflection of the nasal septum are still regarded as ecchondroses and exostoses, and their removal with chisel or saw, or even with a drill, is described. In the description of the Caldwell-Luc operation on the maxillary antrum, it is advised that the antral mucous membrane be entirely removed, on the grounds that a permanent cure can hardly be expected unless this is done. A further recommendation which will not find general support is that the antrum should be packed for forty-eight hours with iodoform gauze; the object of this measure is not indicated. The only external operation on the frontal sinus described is a modification of the Killian technique; the less extensive operations are not mentioned. In the main, however, conditions of disease, and their treatment, are described with an accuracy of detail which justifies the popularity of the work; and this is the more creditable since it has such small pages and closely printed type. The more complete index provides a useful feature in this edition.

Human Embryology and Morphology

Fifth edition. By Sir ARTHUR KEITH, M.D., F.R.S., F.R.C.S. Eng. London: Edward Arnold and Co. 1933. Pp. 558. 32*s*. 6*d*.

IN an introduction to the new edition of this authoritative work of reference on human morphology, Sir Arthur Keith deplores the necessity of increasing its bulk. Few readers will join in his regret, for they will find here the latest information on the subject they happen to be studying, told with that freshness of style which characterises all Keith's work. A new plan has been adopted which should be much appreciated: the allocation of appropriate references and short annotations to each chapter.

Those of us who read this book at the time, some thirty years ago, of its first appearance, can recall the pleasure experienced. Then frankly utilitarian in its object, to many it opened roads far more exciting to explore than the dusty one of utility. These have watched with great satisfaction the gradual retreat of the utilitarian ideal in successive editions, for, as Sir Arthur Keith says himself, who can judge of the future utility of any fact, however idle the knowledge of it may seem at the moment? It is not the practical man who brings about great changes and developments, but the seeker after information for its own sake. Here we have a book which will help the student to understand the human body better, and also give him a storehouse of facts the value of which cannot yet be assessed. It will also give him the benefit of Sir Arthur Keith's ripe experience and great knowledge on many controversial problems, and will help him to form sound judgments of his own.

Sex Life and Sex Ethics

By RENÉ GUYON. Translated from the French by J. C. and INGEBORG FLUGEL. London: John Lane The Bodley Head Ltd. 1933. Pp. 386. 15*s*.

THIS book represents an extreme example of its type. In his demand for sexual freedom the author, who is said to be a widely travelled man, goes to the lengths of urging that there are no such things as aberrations of the sexual impulse, and that the "exercise of sexual pleasure" has nothing whatever to do with morals. These contentions are based upon the writings of Freud, with which M. Guyon displays an imperfect acquaintance. His outlook is throughout avowedly hedonistic, and little consideration is given to the effects of his proposals upon family life.

Bacteriology

For Medical Students and Practitioners. By A. D. GARDNER, D.M., F.R.C.S. London: Humphrey Milford, Oxford University Press. 1933. Pp. 276. 6*s*.

ACCORDING to its preface the chief aim of this book is "to present shortly, readably, and relevantly as much of the vast subject of bacteriology as a medical student or practitioner needs to know; leaving details of technique to a practical course, and emphasising the wider biological relations of microbe and man." No serious medical educationalist, however, would be likely to agree that this work contains enough bacteriology for the needs of the modern medical student. The fundamental generalisations of bacteriology and immunology are dealt with superficially, at times almost flippantly. It would be unfair to take the following sentences, which indicate the dangers of compression, as representative of general laxness. But they indicate the defects of the work: "The *invasive power* of a race depends both on the leucocidal-hæmolytic power of the exotoxin and on the antiphagocytic property of the endotoxin." And again: "A recent piece of highly original and significant research on the health of naval cadets has proved that when a school suffers from recurrent epidemics of diphtheria many boys who have shown no symptoms of infection have nevertheless become *immune*." This statement obviously refers to Surgeon Captain Dudley's undoubtedly "original and significant" researches at the Greenwich Hospital School, but in this particular matter Dudley only gave one more confirmation of a fact well known to every worker in this field. To call a *Glossina* a mosquito is perhaps a venial error, but it suggests that the author has never seen a specimen of this homely looking if formidable fly.

If the book has the faults of the pocket-book it is not without pocket-book virtues. The medical student may find it useful as a bird's-eye view before he tackles the subject seriously or as a means to quick revision before examination. But if he uses it as his only text-book on bacteriology he will fail to acquire a real grasp of the subject.

THE LANCET

LONDON: SATURDAY, JANUARY 20, 1934

COMMON SALT FOR ADDISON'S DISEASE

IT has long been a commonplace that salt is essential to life, but the manner of its regulation in the body has been obscure. Light has come from an unexpected quarter, as the outcome of intensive work which has been carried on during the last few years following the preparation of a potent extract of the adrenal cortex. Such an extract will keep a dog alive for months, although both the adrenal bodies have been removed; and the therapeutic application of extracts standardised on adrenalectomised animals to patients with Addison's disease has yielded very good results, although the choice of dose and of general adjuvant measures still requires much clinical acumen. The main disadvantage of this method is its cost, for the retail price of a minimum daily dose is 10*s*.

The first step in the discovery of the value of sodium chloride as a substitute seems to have been taken by E. J. BAUMANN and S. KURLAND,[1] who observed that the sodium in the blood-serum of adrenalectomised rabbits was decreased by 15 and the chlorine by 9 per cent., while the potassium and magnesium were respectively 42 and 23 per cent. above normal. D. MARINE and BAUMANN [2] found that they could prolong the lives of adrenalectomised cats from 5 to 15 days by giving a daily injection of 50 c.cm. of normal saline. They further showed that the sodium rather than the chlorine was the important ingredient, for they kept cats alive for an average duration of 12·8 days with the equivalent amount of sodium in the form of acetate. The next and most important step was taken by R. F. LOEB,[3] who made a complete analysis of the inorganic bases of the blood-serum in three patients with severe Addison's disease, one of whom died. The chief abnormality was in the sodium content, which was respectively 109, 131, and 108 millimolecules per litre, the usual figure being about 138. The serum potassium was very high, in two cases 8·7 and 7·1 millimolecules per litre (normal 4·8), the chlorine being reduced to 70 and 73 (normal 105). Working with ATCHLEY, BENEDICT, and LELAND, LOEB then made studies of the inorganic base balance in three dogs before and after adrenalectomy.[4] They found no change in any of the dogs after removal of only one adrenal gland, but removal of the remaining gland caused immediate decrease in the sodium of the blood-serum from 147 to 128 millimolecules per litre, and the urine showed a greatly increased sodium output. The blood chlorine decreased from 108 to 89 millimolecules per litre, and the urine chlorine increased, but not to the same extent as the sodium. The potassium and calcium balances were quite undisturbed by the operation. These observations have been confirmed by HARROP, SOFFER, ELLSWORTH, and TRESCHER [5] on dogs which lived for 5–10 days, death being due to shock and loss of body fluids. During the period of observation the blood lost fluid, and the hæmoglobin percentage rose; the non-protein nitrogen and the urea both increased to figures comparable with those found in uræmia, and a decrease occurred in the total base of the blood. On further analysis of the base it was found, however, that the sodium only was diminished in amount; the potassium, calcium, and magnesium were all increased. The proof of the connexion between sodium and dysfunction of the adrenal cortex was finally established by LOEB,[6] who gave his third patient 10 g. additional salt by the mouth. She gained strength, lost all nausea and abdominal pain, and kept well for three months. At this stage she developed some œdema under the eyes, and was advised to take a low salt diet, containing about 2 g. of sodium chloride. In the course of the next five days she became very seriously ill and was readmitted to hospital, when it was discovered that the serum sodium had decreased from 140 to 127 millimolecules. She was given 20 g. of sodium chloride and rapidly improved. LOEB, ATCHLEY, GUTMAN, and JILLSON [7] have repeated this observation on another patient. She was at first allowed to eat an ordinary diet, with as much salt as she wanted. On this diet she was able to be up in the ward, although she complained of nausea, occasional abdominal pain, and slowly increasing weakness. The diet was then changed to one which contained less than 2 g. of sodium chloride a day. At the end of the first day the patient was so weak that she had to stay in bed, and on the second day the prostration and nausea were extreme. The serum sodium which had decreased from 135 to 131 millimolecules per litre during the period of normal salt intake, fell to 123 millimolecules after 48 hours on the low salt diet. The addition of 20 g. of sodium chloride to the diet led to a rapid recovery, and the patient was able to get up on the third day and to leave hospital on the fifth, when the serum sodium had risen to 138 millimolecules per litre. The authors have had other patients who have responded equally well to intensive treatment with sodium chloride. The dose is large, 10–15 g. a day either in cachets or more simply in milk, and is quite well tolerated. It must be spread over the day and the patients usually take a dose on waking. These observations have been confirmed by HARROP, WEINSTEIN,

[1] Jour. Biol. Chem., 1927, lxxi., 281.
[2] Amer. Jour. Physiol., 1927, lxxxi., 86.
[3] Science, 1932, lxxvi., 420.
[4] Jour. Exp. Med., 1933, lvii. 775.
[5] Jour. Exp. Med., 1933, lviii., 17.
[6] Proc. Soc. Exp. Biol. and Med., 1933, xxx., 808.
[7] Ibid., 1933, xxxi., 130.

SOFFER, and TRESCHER,[9] on four patients actually under treatment with cortical extract. It was found possible to withhold the extract when salt was given, though its use had to be resumed in one case. The authors make the pertinent suggestion that the withdrawal of salt from the diet should be used to confirm the presence of Addison's disease. Needless to say this test should only be made if large amounts of potent cortical extract are available, for the condition of the patient may be very alarming after 24 or 48 hours of a low salt diet. If, however, he is no worse for the deprivation of salt it is extremely unlikely that he has Addison's disease.

Clearly this work is of the utmost importance to sufferers from this grave disorder. The treatment should not be regarded as curative, since the sodium chloride administered only replaces that which is being lost in the urine. At the present time it is not certain for how long salt therapy will continue to be effective, as LOEB's first case has only been treated for 16 months. It is possible that this patient will later on require cortical extract, but even then the dose is likely to be much smaller than if no additional salt were given. The biochemical aspect of this work is no less important. It has long been known that one of the inorganic bases, calcium, and one acid radicle, iodine, are controlled in the body respectively by the parathyroid and thyroid glands. Now another base, sodium, is shown to have an intimate connexion with a third ductless gland, the adrenal cortex, and it seems at least possible by analogy that still other bases and acid radicles are also regulated by some ductless gland. The loss of potassium or magnesium, for example, or of the sulphate (SO_4) radicle may also be associated with dysfunction of a gland. Now that the artificial barriers between pathological and inorganic chemistry are rapidly disappearing, there is hope of a fertile coöperation between their exponents in this field.

THE RIGHT TO AN OPINION

THE public repudiation by a hospital board of views expressed in good faith by one of its prominent members seems to us an act of little grace. Whether the chairman of an appeal committee is wise in setting out at a festival dinner his reasons for believing that hospitals will sooner or later have to accept grants from the State is a matter of opinion. It is clear that Sir EUSTACE FIENNES had not reached this conclusion lightly. For a year he has been making great personal efforts to further an appeal which has in fact brought £6000 to Queen Mary's Hospital for the East End, and he has himself visited 30 factories to collect donations. He finds that the difficulty of raising funds increases every year, while the hospitals are needing more and more money for scientific research and special departments. Unlike some of his former colleagues on the board of management he has had the opportunity of studying State-aided hospitals in the colonies and he does not share their horror of this arrangement. Is his heresy so likely to endanger the institution he has been trying to serve that its expression called for stern rebuke?

The basis of the objection to any measure of State support for voluntary hospitals is the desire for unfettered freedom of administration in the interests of the sick poor. Each of our great hospitals takes pride in an individual tradition of service, accepting not unwillingly changes of procedure dictated by the growth of medical knowledge, but quick to resent any scheme of coördination which might involve detailed criticism from without. The smaller hospitals are no less jealous of their autonomy. That some degree of emulation or even rivalry in competing for public support leads to progress can hardly be doubted; the maintenance of solvency at all costs does not pay. A hospital board which carries on in unsuitable buildings with an inadequate staff is suspected of a lack of efficiency as well as of enterprise and does not easily get support even for essential development; but one which takes the risk of erecting a new building with proper accommodation for patients and nurses and then demands money seems to get it. Apart from capital expenditure, there are variations in the manner of distributing income which may not concern a significant proportion of it and yet give to a hospital its special character. One may label as wise economy what another would regard as extravagance, for example, a team of qualified almoners, cooked breakfasts for patients, fresh fruit for nurses. Since 1927 participation in a scheme for the superannuation of nurses has become fairly general; but at least a third of the voluntary hospitals in the country have not yet joined it, and of the rest few assume responsibility for the welfare of senior nurses whose retirement is due before the scheme can give them substantial benefit. Taking only these few examples, if every hospital accepted the highest of the current standards of feeding patients and nurses and of promoting their after-care, its annual maintenance expenses would rise appreciably. Everyone with intimate knowledge of the practice of many hospitals could easily select from each a feature which merits general adoption but for the cumulative expense.

The liberty and independence of hospital authorities may thus mean progress in some respects or backwardness in others. So far the charitable public has not been disposed to criticise their actions or even, it appears, to study such details of administration as are accessible before deciding whether to support a particular hospital; and this is an expression of the confidence felt in the judgment of hospital boards throughout the country. It is generally recognised that the level of administration is high, and few subscribers to hospitals would welcome State grants if their acceptance implied State control; for example of admissions (see p. 166). But for institutions which set a high value on freedom of action to exhibit such fear of freedom of speech argues little faith in the stability of the system of hospital management which they uphold, and is not likely to increase its prestige.

[9] Jour. Amer. Med. Assoc., 1933, c., 1850.

SCARLET FEVER: TOXIN AND ANTITOXIN

THE Cameron prize lecture [1] delivered last year at Edinburgh by Drs. G. F. and G. H. DICK provides an authoritative summary of the newer work on scarlet fever, for much of which the lecturers were originally responsible. The main achievements are familiar: the identification of a hæmolytic streptococcus as the causal organism; the demonstration that a soluble toxin produced by it was capable, when injected in sufficient quantity, of giving rise to the clinical manifestations of scarlet fever, including the rash; and the employment of this toxin as a test for and as a stimulus to the production of active immunity—the serum of actively immunised horses providing a specific antitoxin which is now widely used for treatment, for passive immunisation, and for the diagnostic (Schultz-Charlton) blanching test. Dr. and Mrs. DICK insist that the toxins produced by scarlet fever streptococci and by erysipelas streptococci are separate and distinct, and that in the application of scarlet fever toxin to the control of the disease care should be taken that it is derived from specific strains, that it is highly potent and accurately standardised, and that it contains a minimum of protein. They point out that in the performance of the immunity test which bears their name the strictest adherence to an exacting technique (which they again describe) is necessary. This is a salutary warning because the discordance of many of the recorded results has undoubtedly been due to the use of faulty toxin or to a faulty technique.

During the past ten years the lecturers have had experience of 24,000 spontaneously negative reactors who have passed through one or more epidemics without contracting the disease. For the active immunisation of positive reactors the aggregate of skin test doses of toxin is now very much greater than was at first employed. An initial dose of 500 s.t.d. (skin test dose) injected subcutaneously is increased by weekly stages to 80,000 or 100,000 s.t.d. in the fifth and last. With this range of doses active immunity is produced in 95 per cent. of those injected and endures at Dick-negative level in 90 per cent. for at any rate six years. What has been said about the importance of a reliable and potent toxin applies equally to the specific antitoxin. Dr. and Mrs. DICK think that "most scarlet fever antitoxin available in Europe is not standardised and is considerably weaker than the best American product." The Dick standard of potency of antitoxin is based upon the amount required to neutralise a skin test dose of toxin (as assessed upon human volunteers) and hold it in combination for at least 48 hours. A therapeutic dose, they say, should contain at least 300,000 neutralising units and the prophylactic dose a third of this number. They advocate the use of antitoxin even in mild cases of scarlet fever because complications are apt to develop in mild as well as severe forms of the disease, and they are satisfied that antitoxin reduces the number and severity of complications and lowers mortality. They say nothing, however, about the *route* of injection of the therapeutic dose; this is important because there are some who maintain that even in cases of average or less than average severity the intravenous route is greatly to be preferred. H. S. BANKS [2] employs intravenous administration "not only for severe and septic scarlet fever but for ordinary simple but definite cases" and has obtained results which are "phenomenally good." The acute stage "can generally be arrested in 12 to 24 hours, complications almost wholly prevented, and the period of morbidity reduced to little over a fortnight." [3] Dr. BANKS, indeed, has been so convinced of the outstanding value of the intravenous route that he has considered it "unjustifiable to withhold its benefits from any considerable series of cases merely for the purpose of providing a pretty control experiment," which he holds has already been provided in the practice of dozens of fever hospitals which have employed the, to him, far inferior intramuscular route for the ordinary case. E. E. JOEPCHEN,[4] however, records the results of intravenous injection of concentrated scarlet fever antitoxin in doses of from 4 c.cm. to 10 c.cm. in a series of 100 patients with 100 alternate admissions serving as controls. The prevailing type of the disease was mild or moderately severe, and only four patients were gravely ill with toxic scarlet fever. The complication rate amongst those injected was 58 per cent. (31 per cent. early and 27 per cent. late complications), and amongst the uninjected controls, 42 per cent. 29 per cent. early and 13 per cent. late complications). JOEPCHEN, while admitting that his series is too small to have much significance, concludes that the intravenous injection of antitoxin has no influence upon the number, type, or severity of the complications; but he thinks that in the control of the initial toxæmia intravenous injection, even of small doses, is much superior to intramuscular injection.

Many, but not all, observers agree with the DICKS that antitoxin does something to prevent complications; some deny that it is of any value. It is clear that the difficulties of comparing the therapeutic results of one author with those of another are, in the case of scarlet fever, manifold. The disease itself, for example, has a wide range of clinical severity not only in different countries but in the same country at the same time. In this country at present it is very prevalent but very mild, and H. M. WOODS [5] thinks that the death-rate has nearly reached its lowest level which may "merely be the trough of a wave." Evidently American and continental physicians are experiencing a disease on the whole very much more severe than has been seen in England for a generation but which may very likely be seen again. Another difficulty arises from the differences in potency, dosage, and route of injection of the specific antitoxin; and yet another, quite as formidable, from the publication of conclusions drawn from insufficient data.

[1] Edinburgh Med. Jour., January, 1934, p. 1.

[2] Public Health, January, 1934, p. 132.
[3] Jour. of Hyg., 1933, xxxiii., 282.
[4] Deut. med. Woch., Dec. 1st, 1933, p. 1785.
[5] Med. Res. Council, Spec. Rep. Ser. No. 180, London, 1933.

THE D.C.O.G.

THE British College of Obstetricians and Gynæcologists was founded in 1929 and one of its objects was to improve the standard of midwifery among general practitioners who wish to hold obstetric appointments in maternity hospitals, whether under voluntary or municipal management, and to act locally as obstetric consultants. The original intention of the college was to elect to its membership only those definitely established as consultants in obstetrics and to institute a diploma for the younger body of men, who desired some form of recognition. But as it was not found possible at that time to frame a diploma the membership was widened to include those who had held resident appointments in obstetrics and gynæcology, were prepared to submit records and commentaries of their cases, and to undergo an hour's oral and clinical examination. Now, after over three years' experience gained by the examination committee, the college has again been impressed with the fact that the present training of students in obstetrics is insufficient to fit them for responsible work in maternity services, and has decided to award a diploma to registered medical practitioners who have had special post-graduate training and experience in the subject and satisfy the examiners appointed by the college. The regulations for this diploma, which carries the letters D.C.O.G., are set out on p. 158 of our present issue. The membership of the college, being intended for those aspiring to special practice in obstetrics and gynæcology, demands a larger and wider experience than is possible for those entering family practice. Many candidates for the membership have, we understand, suffered rejection because they had insufficient training and experience, and for many of them it may be impossible, at the stage of their career which they have reached, to undergo further training and to hold further resident posts. They will however be suitable candidates for the diploma, and a special consideration is shown to those who have been engaged in practice for at least ten years.

ANNOTATIONS

THE EPILEPTIC CHILD

FOR financial reasons no new places are being provided in special schools at present. This makes it very desirable that the places should be used to the best advantage, and in a recent annual report [1] Sir George Newman discusses the application of this principle to residential schools for epilepsy. The intelligence of epileptic children varies within wide limits, the social outlook for the lower grades being very poor. Imbecile children are by law excluded from certified schools for epileptics, but a recent review of the 605 children in the existing residential schools leads the chief medical officer to believe that something like 10 per cent. should be classified as ineducable, and a further 20 per cent. as feeble-minded but educable. Both these groups will, or should, come under the ægis of the Board of Control at the age of 16, if not earlier; and if their places at special schools were occupied by children of more intelligence, the nation would be getting better value for its money. As a move in this direction Sir George Newman asks for the discharge of any children who are not benefiting by the instruction provided. This is taken to mean all cases with intelligence quotients of 50 or less, and some with quotients up to 55 or even 60. Then he would like a periodic review made of the remaining children, so that those whose intelligence is at a standstill or deteriorating may not be overlooked. The probationary period for feeble-minded children of doubtful educability should not exceed a year. And finally both school authorities and medical officers should select cases for admission with greater care.

These suggestions will, we think, meet with general approval provided that something is done for the lower-grade children who are discharged or refused admission. The Education Acts evidently intend that the schools shall provide for all epileptic children above the grade of imbecile. If those below it are outside the purview of education authorities, they must be not merely notified to the Board of Control but dealt with adequately by local authorities under the Mental Deficiency Acts. In most cases supervision will not be enough; institutional care will be required. Low-grade children, with frequent epileptic fits, can seldom be properly cared for in an ordinary household, and their presence is often seriously detrimental to others. It is now very difficult to find places for these children in suitable institutions, and to follow out the new policy without regard to this need must bring hardship to many children and unhappiness to many homes. A further proviso is that local education authorities will make greater efforts than heretofore to send brighter epileptic children to the residential schools. It would be foolish to empty the schools at the bottom without taking steps to ensure that they will be filled at the top. It is for school medical officers to make strong representations to authorities and parents in suitable cases; upon them will depend the success or failure of the new policy.

One statement in the report calls for criticism. The advantage of early admission is stressed, and the suggestion made that while there are waiting-lists no child should be admitted who is over 13. But, taking the long view, this is surely hard on boys and girls of good intelligence who develop epilepsy late in school life. These are precisely the cases which will get the most benefit out of institutional treatment. From the point of view both of the disease itself and of the mental condition the outlook for them is better than that for children whose epilepsy starts earlier in life. In other words they will get the best value out of the training as well as the treatment, and it seems hardly fair to handicap them because the complaint was inconsiderate enough not to appear earlier.

[1] The Health of the School Child. Chap. VI. H.M. Stat. Office. 1933.

THE USE OF SEDATIVE DRUGS BY MIDWIVES

THE Central Midwives Board and the General Medical Council are exchanging views about the proposed new rule for the guidance of the midwife in her work. The original draft has been modified by the C.M.B. in the hope of meeting general acceptance, and the rule now runs: "A midwife must not on her own responsibility use any drug unless in the course of her obstetric training, whether

before or after enrolment, she has been thoroughly instructed in its use, and is familiar with the dosage and methods of its administration or application." The G.M.C. suggested the addition of the clause "save in grave emergency" to be inserted between the second and third words. The C.M.B. was unwilling to accept this addition, but the executive committee of the G.M.C., when it met on Nov. 27th, confirmed the Council's view that it should stand part of the rule; and that is at the moment the position. There is no question in the minds of either body either about the desirability of allowing midwives the use of sedative drugs or of restricting her use of them within certain definite limits. It is agreed that there are many women of nervous or excitable temperament who require some kind of sedative at the outset if normal labour is to be achieved. A dose of chloral and bromide is as much part of the midwife's outfit as is her catheter or nail-brush; and long before there was any Act to regulate the practice of midwives, laudanum was available in the family medicine chest. It was quite natural, when the Dangerous Drugs Act was passed, for a clause to be inserted in the schedule to enable midwives, who had notified their intention of practising, to obtain opiates, although not morphia itself. Time was when a number of midwives, at all events in certain areas, had received little or no training in the use of these drugs; but the midwife who has not passed an examination has almost died out, and every certified midwife now has been examined on the use of such drugs and solutions as may be required in practice, the conditions which call for their use, the mode of their administration or application, and their dangers; moreover, every midwife must note in her register each occasion on which she is under the necessity of administering or supplying in any way any drug other than a simple aperient, the name and dose of the drug, and the time and cause of its administration or application. In practice the rules are working out all right, and there has been practically no need for disciplinary action on the part of the Board in regard to the use of sedative drugs by certified midwives. As a matter of fact, if the midwife is not trained in the use of drugs, she does not carry them, so there is now no longer any need for anxiety on this point. The objection, as we understand it, on the part of the Board to the insertion of the words "save in grave emergency" is that their insertion makes the rule more difficult to understand and that it emphasises what the Board does not wish to have emphasised, namely, that in any emergency the midwife should try measures of which she is ignorant. It is unnecessary for the protection of the midwife, because the preceding rule contains a general instruction that the midwife in the face of grave emergency will run no risk of penal proceedings if she exceeds her province in manipulation or any form of treatment.

THE DIABETES MORTALITY

As insulin keeps diabetics alive but does not cure them, it might be assumed that with their safe shepherding through the younger to the older age-groups there would be a decline in the number of diabetic deaths in the former and a rise in the latter. A recent study by O. Scheel[1] of the mortality from diabetes in England and Wales, Norway, and Sweden suggests that matters are not so simple as all that. He assumes that the insulin era began in England in 1923 and in Norway and Sweden in the following year. Since then the diabetes mortality has risen instead of fallen in all three countries, and is now higher than it has ever been. This trend is also apparent in many other countries, as is shown in a statistical review made by Elliott Joslin, Louis Dublin, and Herbert Marks (the first of a series of studies of diabetes mellitus to be published by these authors).[2] The United States, they find, has a higher death-rate from diabetes than any other country in the world—22 per 100,000 in 1932—and the rate in the area comprising the original registration States has been during the past few years more than double its level in 1900. Generally their data show that the rise in mortality from diabetes has been world-wide. It is, of course, true that, with the advance of medical supervision, particularly in rural areas, many deaths which formerly were put at the door of senile decay are now traced to diabetes. Again, as in the case of cancer, the present greater number of old people in relation to the young must yield a higher mortality for such an old-age disease as diabetes. But even when each age-group is taken by itself, some show a considerable rise in the diabetes mortality, though the American workers find that it is mainly confined to ages over 50. In childhood and in early adult life they find that there has been a distinct improvement both among males and females. With men this improvement extends right through middle life and into the early part of old age, but with women it ceases by age 50, and there are substantial increases in the death-rates during late middle life and throughout old age, which, as our U.S.A. correspondent points out on another page, have much perplexed the statisticians. Similarly in Norway Scheel finds that the rise in mortality is particularly marked for women over 60 years of age, so that among 1095 deaths from diabetes in persons over 60 since 1924, the ratio of males to females was as 438 to 657. In the experience of the industrial department of the Metropolitan Life Insurance Company this excess in females is also limited to middle life and old age. In childhood and early adult life the rates of the two sexes do not differ significantly, but around the menopause the female rate begins to increase very rapidly, much more so than the rate for males of the corresponding ages. The result is that in this experience in the years 1926–30 the female rate exceeded the male by only 29 per cent. at ages 35–44, increasing to 69 per cent. at ages 45–54, 108 per cent. at ages 55–64, and 89 per cent. at ages 65–74. Why this comparatively high incidence and more rapid increase in mortality in elderly women? Most of the deaths discussed by Scheel represented recent cases. It could not, therefore, be assumed that they were mainly the relics of a younger generation of diabetics kept alive by insulin till the patients had turned 60. Dr. Scheel is inclined to think that women who have passed the menopause are less capable than men of keeping to a strict diet. It may also be that elderly women are kept less conscientiously to an insulin régime than are younger ones. It must be remembered, however, that, for some years after the introduction of insulin, the dosage was largely experimental and that even now the adjustment of diet and insulin is certainly not standardised on a permanent basis.

The American insurance figures certainly reveal a distinct improvement amongst young persons since the introduction of insulin. Prior to its discovery the trend of diabetes was upward among children and young people, but in 1923–30 the mean mortality-rate of males under 25 years of age was only 2·3 per 100,000—a decrease of 34·3 per cent. from the mean rate of 3·5 which was recorded in the twelve years

[1] Nordisk Medicinsk Tidskrift, Sept. 9th, 1933, p. 1057.

[2] Amer. Jour. Med. Sci., December, 1933, p. 753.

preceding the introduction of insulin. Among females of these ages the fall was approximately the same, 31·3 per cent. At ages 25–44 a decline of 36·6 per cent. is recorded in the rate for males, 16·2 per cent. for females. The problem of increasing mortality, it is clear, is limited to older people and mainly the female sex. The various factors which tend to produce this increase, and also those productive of improvement, the American workers propose to discuss in a subsequent paper.

CHEYNE-STOKES RESPIRATION

THE rhythmic respiration in cardiovascular cases described by John Cheyne and William Stokes may become regular when the patient's attention is stimulated. This curious fact is the subject of two recent communications, one by Dr. J. A. Greene, of Iowa,[1] the other by MM. Lian and Deparis, of Paris.[2] Both conclude that this type of breathing cannot be completely explained in terms of an impaired respiratory centre which responds only to exaggerated fluctuations in its chemical environment. The French authors take this as evidence that the cerebrum exerts a controlling influence on the centre, and point to the frequency, in cardiac and nephritic patients, of Cheyne-Stokes respiration during sleep. They also describe more severe cases which respond neither to mental stimulus nor to oxygen inhalation but only to administration of 5–10 per cent. carbon dioxide. They consider that here the centre itself is devitalised to such a degree as to be beyond cerebral control, requiring direct stimulation. They infer that respiration is under combined cerebro-bulbar control and that, while Cheyne-Stokes respiration is always pathological, it may not always have the same significance. Greene remarks the same features in the Cheyne-Stokes respiration of cardiovascular patients, and in addition that during the periods of hyperpnœa the chest assumes a position of partial inspiration upon which the regular respirations are superimposed. The effect of carbon dioxide is to produce regular respiration by fusion of these periods, the chest never achieving the full expiratory position. Inhalation by normal individuals of oxygen or carbon-dioxide mixtures never interferes materially with the expiratory position of the chest, and much corroborative evidence is adduced that Cheyne-Stokes respiration of this type may have a reflex rather than a purely chemical origin. No definite theory is put forward however. In cases of increased intracranial pressure, according to Greene, Cheyne-Stokes respiration has a different origin. It is then due to anæmia or oxygen-lack of the respiratory centre, and responds immediately to administration of oxygen. It is further characterised by the chest attaining the full expiratory position, not only during the period of apnœa, but also after every respiration of the hyperpnœa. There are many possible physiological explanations as to why oxygen should benefit some cases and carbon dioxide be necessary in others, but if Greene's classification is correct the distinction is placed on a clear-cut practical basis and may reconcile divergent views on treatment. With regard to the possible nervous origin and peculiar characteristics of Cheyne-Stokes respiration in patients with cardiovascular disease, it is interesting to recall the series of respiratory centres described by Lumsden in the cat. The "apneustic centre" produces a state of sustained inspiration broken at intervals by occasional expirations, but only when freed from the highest or "pneumotaxic centre." It is conceivable that slight impairment of the latter may give rise to a periodic type of breathing, where regular respirations are superimposed on fluctuating positions of the chest wall. There is no doubt that the nervous control of respiration is complicated, and that progressive slight impairment of the centres from above downward could be made to account for many abnormalities in breathing.

[1] Arch. Internal Med., 1933, lii. 447.
[2] Bull. et mém. Soc. méd. hôp. de Paris, Dec. 18th, 1933, p. 1511.

SIR GEORGE BUCHANAN'S RETIREMENT

Sir George Buchanan is retiring from his position as a senior medical officer to the Ministry of Health as from Feb. 18th next. So far as the Ministry is concerned there is thus terminated an association of nearly forty years, inasmuch as Sir George was appointed in 1895 by the old Local Government Board as one of the medical inspectors, and from that time forward has done great work for the country along many divergent lines of public health activities. During the period 1906–1911 he acted as chief inspector of foods and subsequently, until the formation of the Ministry of Health, was the chief assistant medical officer to the Board, becoming on the formation of the Ministry the senior medical officer. In this capacity he served on various Royal Commissions and departmental committees dealing with numerous aspects of public health. And in one direction his work has been practically continuous, since from the beginning to the end of his official career he has been identified, in the Government service and outside it, with sane and practical application of scientific epidemiology, which he learnt from that acknowledged master, W. H. Power.

In 1914, on the outbreak of war, he was immediately attached to the Army Sanitary Committee with the honorary rank of lieutenant-colonel, and during the following five years he was at different times a member of the Medical Advisory Committee to the British Mediterranean Expeditionary Force and the Mesopotamia Expeditionary Force. No public reports were made of the particular services rendered by individual members of the Army committees, but, as president of the epidemiological section of the Royal Society of Medicine at the close of the war Buchanan necessarily disclosed something of the strenuous labours on which he had been, and still was, engaged. With the conclusion of hostilities there commenced his association with the League of Nations. A member since its foundation of the League of Nations Health Committee, of which body he is now vice-president, he became also the Government representative of the Office International d'Hygiène Publique, and in 1919 was a member of the Poland Typhus Commission instituted by the League of Red Cross Societies. He was appointed president of the League of Nations Cancer Commission and was a member of the mission instituted by the League for the public health reorganisation of Greece. In 1926 he was the chief British delegate to the International Sanitary Conference, and during the last twelve years his assistance has been required at numerous Government and official investigations, thus making available a unique familiarity with inernational public health matters.

No more detailed reference to Buchanan's public services is needed here, for this is not an obituary notice. While his term of office at the Ministry of Health ceases, all will be glad to learn that he will continue his international health work at Geneva, with the League of Nations, and in Paris, with the Office International, while the Society of Apothecaries of London have provided for him at their Hall an office in this country. This fact is significant. The League of Nations has been criticised for its inability to effect as yet any substantial part of a magnificent pro-

gramme; much of the criticism has been unjust and has come most loudly from places where the unavoidable difficulties in the carrying on of the work of the League have been least appreciated; but its activities in the cause of international health have produced material results of a sort which all must praise. The same may be said of the official work for the control of infectious diseases carried out under the international conventions in Paris. In all of this work Sir George Buchanan has played a part for which, as our principal British representative, he has earned the country's thanks.

EXPERIMENTAL EPIDEMIOLOGY

THE ancients had a coherent doctrine of epidemics which they seem to have found fairly satisfying though it did not lead to very much in the way of prevention or treatment. Epidemics of disease were to them things of themselves which arose through various combinations of external circumstances; the only thing of practical importance which they appreciated was that they were, if kept to themselves, self-limited and they could accordingly be dealt with by segregation and patience. The discovery of specific microbial causes made it necessary to replace the doctrine by a theory, and, despite all the practical weapons which the new knowledge put into the hands of hygienists, it seemed for some time almost impossible to bring the bacteriologists and epidemiologists into harmony. The complete theory of epidemics in microbic terms is still wanting though much progress has been made in recent years, and the discovery of carriers, of immunisation by subinfection, of the production by epidemics of races of rats immune to plague and so on has done much to encourage a belief that it will some day be possible to rewrite Creighton in bacteriological language. In the last fifteen years or so the more careful and specific observation of human epidemics has also been supplemented by their experimental study in populations of small laboratory animals, and in the January number of *Science Progress* Prof. Major Greenwood gives an interesting account of some of the investigations which he has made in conjunction with Prof. W. W. C. Topley and Mrs. Wilson. The work is long and laborious and apt to be disappointing but, though some people may question the suitability of mice for the purpose, no one can now doubt that the method is practicable and within limits of significant value. The study of prolonged epidemics in mouse populations has shown that they are about as mysterious in their fluctuations as human infectious diseases; the experiments ask more questions than they answer but the method is one by which answers can in the end be obtained, which cannot be said of the human experience. It also seems clear that no simple explanation of epidemics as the reaction of certain soils to certain seeds can yet be given. But of one feature there is a clearer picture. The ancients knew that if an epidemic was to come to an end it must be kept to itself and that fresh persons admitted to an infected town were a danger to the surviving inhabitants as well as to themselves: a moribund epidemic might be fanned into a blaze by new arrivals. The mouse experiments, done in a variety of ways, fully bear out this appreciation of the importance of the number or concentration of susceptible individuals in promoting the virulence of an epidemic. It is commonly believed, though it has never been clearly shown, that this is due to some change in the microbe, due to its being able to indulge in an exuberant and often successful attack on individuals who have no more than their natural resistance. Be that as it may, Prof. Greenwood points out that there is much converging evidence that an epidemic comes into being when the susceptible individuals form some critical proportion of the whole population in an area within which the infection is transmissible. Hence the periodic waves of measles and, in wild animals, the epidemics which usually bring excessive increases of population to an end.

GOLD SALTS IN RHEUMATOID ARTHRITIS

IT is now five years since Dr. Jacques Forestier of Aix-les-Bains, impressed by the similarity between chronic tuberculosis and rheumatoid arthritis, first tried gold salts in the latter disease. Since the publication [1] in England of his observations a number of other workers have used this form of treatment, and their results seem on the whole to justify his optimism.[2] In delivering the Hunterian lecture of the Hunterian Society last Monday he showed that his method remains in essentials the same as when he introduced it. He emphasised his view that it is of use only in the rheumatoid—he considers these infective—forms of arthritis, and that it has no place in the treatment of the osteo-arthritic group, which he calls "arthroses." To attain success it should begin as early as possible, preferably within two years of the onset of the disease; in these cases one may hope to restore the joints to normal and the patient to good health, whereas later it is obviously impossible to replace cartilage and restore function and health completely. Secondly all treatment should be controlled by laboratory tests, among which he mentioned estimates of resorcin flocculation and red cell sedimentation. Though he does not consider these tests in any sense specific, they serve as guides to the activity or otherwise of the disease; thus the sedimentation-rate, which he regards as particularly useful, shows great acceleration during the active phases of the condition and goes back to normal as the result of treatment. Thirdly he gave it as his opinion that one or other of these tests should be employed at intervals for at least two years after all activity seems to have ceased; for they may reveal a return of infection which can be checked by further treatment. While it was important to discover whether a patient is intolerant of gold, Dr. Forestier thought that the fear of its toxicity could easily be exaggerated. In enumerating the milder toxic manifestations and the few contra-indications, he maintained that the only serious complication was of a hæmorrhagic nature. With the preparation Solganol B, he said, cases of destruction of the red and the white cells had been recorded, and though this had not happened with other preparations, any tendency to hæmorrhage—as, for example, purpura—should of course receive serious consideration. As to the methods of administration he preferred the intramuscular route to the intravenous, and advocated small doses at regular intervals. The preparations he had employed were aurothio propanol sulphonate of sodium (Allochrysine), sodium aurothiosulphate (Sanocrysin), thiomalate of gold and sodium (Myocrysin), aurothioglucose (Solganol), which was highly soluble in oil, and finally aurothioglycolate of calcium, which was highly insoluble in oil or water. It will be recalled that most of the cases described by Dr. Gerald Slot and Dr. P. M. Deville in our last issue were treated with solganols given intramuscularly.

As in his previous paper, Dr. Forestier emphasised the importance of combining the injections with suitable physiotherapeutic and spa treatment. The remedy is one to be used with discretion and in its

[1] THE LANCET 1932, i., 441. [2] Ibid., 1933, i., 872, 1037.

proper place. But with these reservations many will agree with him that gold salts appear to offer better prospects than any other form of treatment at present known. Of 500 "early" cases—i.e., cases of less than two years' duration—which Dr. Forestier has followed up during a period of 2–5 years, half have been completely cured and the remainder much improved. Of those of longer standing some 80 per cent. were described as improved and 20–30 per cent. as cured.

THE RENAL TRACT IN PREGNANCY

THE alterations apparent in the renal tract during pregnancy and the puerperium seem to excite more interest in Germany and America than in this country. Yet I. J. Strumpf [1] reports that intravenous pyelography revealed changes in 46 out of 50 healthy primigravidæ, and his series is probably not unusual. In discussing the possible causes he maintains that factors such as position of the fœtus, type of pelvis, weight and shape of uterus, tenseness of the abdominal wall, and constitutional type have no influence on the dilatation, displacement or distortion of the urinary tract. In reaching this conclusion, however, he uses merely the presence or absence of dilatation to determine the importance of these factors; and as it was absent in only four of his patients the figures are by no means convincing. Nor, in dismissing the possible effect of a tense abdominal wall, does he explain the finding of other investigators that marked dilatation is much commoner in primigravidæ than in women who have borne a child. In support of his belief that the uterus exerts no pressure on the ureters, he declares that in non-pregnant women ovarian cysts, fibroids, and pelvic cellulitis do not cause ureteral dilatation. This is in direct contrast to the findings of Dugald Baird,[2] who describes dilatation in nulliparæ with abdominal tumours, and by graphic records [3] justifies his conclusion that the pressure of the uterus plays an important part in causing dilatation and stasis during pregnancy. Kretschmer, Heaney, and Ockuly [4] for their part have tried to determine the stage of pregnancy at which dilatation begins, and to this end have examined 31 healthy women by intravenous pyelography—first between the second and fifth months and later between the sixth and ninth. Two such examinations, however, can scarcely be regarded as sufficient, for the time of onset certainly varies within wide limits. They have also used intravenous pyelography to ascertain when the dilatation disappears, and here their conclusions are vitiated perhaps by the fact that, owing to lack of obstruction, the method gives poor visualisation of the ureters in the puerperium. They found dilatation of the urinary tracts of all the pregnant women examined, and they agree with Strumpf that the position of the fœtus has no influence on it. But they throw no light on its origin.

In the opinion of L. M. Randall and S. E. Murray,[4] retention is the most important cause of urinary infection in the puerperium and in such cases they advise early catheterisation and drainage until residual urine is less than 50 c.cm. Of 984 puerperal women they found that 208 had retention of urine requiring catheterisation, but their definition of retention is different from what is generally accepted in this country, the patient being catheterised if she has not passed urine within 12 hours after delivery. Under this regimen of care of the bladder postpartum, "3500 women have been confined with no untoward effect on the urinary tract"; but in the absence of further details it can hardly be assumed that there were no cases of infection of the bladder in so many as 3500 cases delivered. For the treatment of such infection H. W. E. Walther and R. M. Willoughby [5] have tried Pyridium in 3000 cases and hold that in doses of 0·1 to 0·2 g. by mouth three times daily it is superior to other drugs. J. B. Gillespie,[6] on the other hand, at the Mayo Clinic has shown that pyridium, at concentrations stronger than can be passed through the kidney, is not bactericidal; and Walther and Willoughby's work is not sufficiently controlled to prove the contrary. The latter also advocate repeated renal lavage or drainage with in-dwelling catheter in cases of postpartum infection, and state that by one or other of these methods the temperature was reduced to normal in from 1 to 18 days, the average being 5. Postpartum renal infection was found in 1·5 per cent. of 2400 women admitted for delivery, but no distinction is made between true puerperal infection and the lighting-up of a pre-existing pyelonephritis of pregnancy. The problems are clinically distinct, for it is doubtful whether puerperal pyrexia due entirely to urinary infection will last longer than five days on simple treatment with forced fluids and alkalis.

E. G. Crabtree and G. C. Prather [5] write instructively on the later history of patients who have had a urinary tract infection during pregnancy. Their experience dates from 1919 and from a review of 400 cases they think that a history of cured pre-existing infection is not important in prognosis. The majority of infected patients entering on their first pregnancy will have febrile symptoms, and it is seldom that infection is cured while the pregnancy lasts. A patient who carries over an infection from a previous occasion will have an infected pregnancy, and it is therefore important to cure the condition before the further pregnancy begins. If this is done reinfection is improbable. Crabtree and Prather say that there is evidence of an acquired tolerance, which makes subsequent infections less severe, but unfortunately they do not give any information about the general health of infected patients, the likelihood of permanent renal damage, or their views on what determines the speed of natural cure. Their paper is nevertheless of great value and incidentally demonstrates the importance of accurate urological examination and treatment during pregnancy.

Mr. Henry Lamb, whose painting "The Artist's Wife" has been purchased for the nation by the Chantrey trustees, is a member of the medical profession. Before the war he was a student in the University of Manchester, where his father, Sir Horace Lamb, was professor of mathematics, and in 1916 he qualified from Guy's Hospital. During service abroad he held a captain's commission in the R.A.M.C. and won the Military Cross. Since the war he has worked as an artist and has reached a distinguished place in contemporary painting.

THE death occurred on Sunday last, Jan. 14th, at Bucharest, of Dr. Jean Cantacuzène, professor of bacteriology in the university of that city and head of the Serological Institute. Cantacuzène was not only a distinguished hygienist but for many years had taken a prominent part in the work of the International Health Office in Paris and on the Health Committee of the League of Nations. His serological work is well known in this country.

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[1] Amer. Jour. Obst. and Gyn., December, 1933, p. 857.
[2] THE LANCET, 1932, ii., 983.
[3] Jour. Obst. and Gyn., Brit. Emp., 1933, xl., 472.
[4] Jour. Amer. Med. Assoc., Dec. 23rd, 1933.
[5] Ibid., Dec. 16th, 1933.
[6] Proc. Staff Meet., Mayo Clin., 1932, vii., 372; Amer. Jour. Dis. Child., 1933, xlv., 254.

THE PREVENTIVE ASPECTS OF MEDICINE

A Series of Lectures in progress during the Winter Session at King's College Hospital Medical School

XI.—PREVENTION OF DISEASES CONVEYED BY FOOD

MORBID conditions attributable to the food we eat are of the most diverse nature, ranging in degree from slight ailments to serious diseases. They have probably been recognised from the earliest times, for do not the sons of the prophets say to Elisha "There is death in the pot," and Xenophon describes how his men suffered from narcotic poisoning arising from honey gathered from poisonous flowers. For want of a better name we may include all these conditions under the term "food-poisoning." Excluding cases in which a poison has been added to food with criminal intent, the vitamin-deficiency diseases, which have been considered by another lecturer, and peculiar idiosyncrasies of individuals to certain foodstuffs, that is, food sensitisation or allergy, we may distinguish three classes of food-poisoning: (1) the foodstuff itself is poisonous; (2) a chemical poison has accidentally gained access to the food; and (3) the food has become contaminated with living organisms or their products, to which I shall devote most attention.

Poisonous Foods

With regard to the first group, the food itself being poisonous, either it is eaten unknowingly, or by mistake, or in excess. Thus the tap-root of aconite has been substituted for horse-radish; children may eat the attractive berries of nightshade; or poisonous toadstools, particularly the deadly *Amanita*, may be mistaken for edible ones or for mushrooms. Rhubarb leaves used instead of cabbage are deadly by reason of their high content of oxalates, and even nutmeg, except in culinary doses, is toxic. Certain tropical fish are poisonous, likewise the roe of the European barbel, and apparently sound mussels not infrequently cause illness, which has been attributed to a poison, mytilotoxin, apparently generated under unknown conditions. Lathyrism, due to the use of certain pulses, seems to belong to this group.

Chemical Poisons

Chemical poisons sometimes find their way into foodstuffs accidentally. In 1900 a celebrated epidemic of peripheral neuritis in the Midlands was traced to arsenic in beer, and now there has arisen a scare of arsenic in fruits and vegetables that have been sprayed with arsenical insecticides. Chronic lead poisoning, commonly an industrial disease, may arise from the use of soft water which is plumbosolvent, and the notorious "Devonshire colic" arises from cider kept in lead containers. Lead glazes for crockery and enamelled cooking ware may entail some risk, but it is a remote one. Acute zinc poisoning has been caused by the action of acid foods or drinks upon their zinc-lined containers. Copper, lead, and chromium compounds have been used as agents for colouring foodstuffs. Acute outbreaks of gastro-enteritis may be due to antimony. Antimony oxide is widely used as a cheap substitute for tin oxide in enamelling hardware, and lemonades prepared in jugs of this kind have caused at least three considerable outbreaks involving 165 persons, the tartaric or citric acid of the lemonade dissolving dangerous amounts of antimony from a defective enamel. Tin gets into canned foods from the container, but tin seems to be practically innocuous. The same probably holds good for aluminium, much used for cooking utensils. Ill-defined attacks of illness have been ascribed to poisoning by aluminium or its alloys, but the Mellon Institute, Pittsburg, after an exhaustive inquiry, concluded that aluminium is not a poisonous metal and does not give rise to any disease, and our own Non-Ferrous Metals Research Association states that an impartial survey of the subject has established its harmlessness. A remarkable series of cases of acute gastro-enteritis in New York and New Jersey hotels was believed to be acute non-fatal cyanide poisoning, caused by a particular silver polish which contained 20 per cent. of sodium cyanide.

Various preservatives used to be extensively added to foodstuffs, but are now mostly prohibited. Such were formalin, boric acid, benzoic and salicylic acids or their salts, sulphurous acid and sulphites, and others. Foods packed in glass containers may contain glass fragments, but they are relatively uncommon, and there is no direct evidence that they have caused injury.

Some of the accidental happenings mentioned above will occur from time to time however much care is taken, but many of them are preventable. Children should be warned not to eat unknown berries; only those who know should experiment with supposed edible toadstools; sophistications of foods, such as the addition of colouring, should be, and for the most part are, prohibited nowadays, and manufacturers should employ proper materials for their food containers.

Infections and Toxins

Diseases conveyed by food are principally infective conditions caused by parasites, which are generally bacteria, less frequently helminths, and occasionally fungi and protozoa, the parasitic agent being present in the food and ingested with it. Somewhat inconsistently, perhaps, we generally include in the food-poisoning group of diseases a few of those caused by toxins present in the food which have been generated therein by parasitic agents.

Of the many diseases that may originate in food some are of little importance in this country and others only exceptionally arise in this way. Asiatic cholera, for instance, is mainly conveyed by infected water, but may be transmitted by raw vegetables, such as salads, by soups, milk, and butter. The enteric fevers again are mainly conveyed by infected water, as Dr. Ralph Williams pointed out in a previous lecture in this series, but may also be contracted through the consumption of contaminated shell-fish such as oysters and cockles, salads such as water-cress, milk, ice-creams, butter and cheese, bread, and other foodstuffs. One of the most serious outbreaks of typhoid fever in recent times was that caused by infected milk in Montreal in 1927 with 5000 cases and nearly 500 deaths. Scarlet fever is another disease that may be contracted from infected milk, and diphtheria occasionally arises in the same manner.

Tuberculosis, particularly in childhood, is often, perhaps generally, conveyed by milk and occasionally from tuberculous meat. Undulant fever of the Mediterranean variety, formerly so prevalent in Malta, is conveyed almost exclusively by goat's milk, and of the abortus variety by cow's milk. Occasionally outbreaks of sore-throat, of bacillary dysentery, and of that ill-defined condition summer diarrhœa of infants, and rarely foot-and-mouth disease are likewise attributable to milk infections.

Meat may be a vehicle in the transmission of anthrax, principally among primitive races who will devour carcasses of beasts that have died casually, and meat and meat foods are common sources of food-poisoning proper, largely due to salmonella infections.

With the exception of foot-and-mouth-disease, which is due to a filtrable virus, all the diseases so far mentioned are bacterial ones. Protozoal diseases are but rarely transmitted by food. Amœbic dysentery is said to be conveyed by infected raw vegetables such as lettuce and by other foodstuffs, and possibly balantidial dysentery and giardia enteritis may sometimes arise in like manner, but these are the only protozoal affections that I know of, with the exception, perhaps, of sarcocystis, that are transmitted through the agency of food. On the other hand, several important diseases caused by worms are transmitted by food and frequently by food alone. These include trichinosis, derived from eating infected pork or ham, and several tape-worms. *Tænia solium* is derived from eating "measly" pork, and *Tænia saginata* from "measly" beef, the "measles" being little bladders embedded in the meat which are the embryonic cystic stage of the tape-worm. *Dibothriocephalus latus* may arise from the consumption of certain fresh-water fish, and hydatid disease in man from food containing the eggs of *Tænia echinococcus*, which is parasitic in the intestine of the dog.

Some of the flukes may also be transmitted by the consumption of raw vegetables or certain crabs infested with the embryos. Thus infection with *Fasciolopsis buski*, an eastern fluke widely distributed from India to China, may be acquired through eating the cercariæ or embryonic forms encysted upon raw vegetables. ascaris and other round-worm infections are also conveyed by food.

Fungi do not appear to be agents of importance in causing human diseases transmitted by food. Actinomyces, a form intermediate between the true bacteria and the fungi is said to have been contracted by nibbling grain and grass; I am not aware that this disease has ever been traced to actinomycotic meat, which is not uncommon. Ergotism is an intoxication due to the consumption of ergot-infected rye, and I have seen gastro-enteritis following the consumption of unsound ripe fresh figs, presumably due to fungoid activity.

In this rapid survey I have indicated the vehicles by which certain infections or intoxications may reach man. Another question particularly important from the preventive side is: How do the vehicles become infected? Animals other than man do not suffer from cholera, the enteric fevers,* and the dysenteries, and here infection of milk, vegetables, and other foodstuffs is fæcal—through direct human fæcal contamination or contaminated water, the infection being derived from those actually suffering from the disease or from a healthy carrier. In tuberculosis, the undulant fevers, and sore-throat, the contamination of milk or meat arises from infected animals. In scarlet fever and diphtheria infection of milk is almost always due to a human carrier; very exceptionally in diphtheria and possibly in scarlet fever the cow may itself be infected.

Food-poisoning proper can take two forms, one due to infections with living organisms, the other to toxins that have been formed by the activities of living organisms. The three cardinal features of food-poisoning are diarrhœa, vomiting, and abdominal pain, that is to say, it manifests itself as an acute gastro-enteritis. Occasionally, vomiting may be infrequent or absent.

Infections with Living Organisms

In infections with living organisms the symptoms come on in from 6 to 24 hours, rarely as long as 36 hours, after consumption of the foodstuff—too long an incubation period to be associated as a rule with a chemical poison, and too short an one to be associated with most other infective disorders, even were the symptoms similar. Some degree of pyrexia may be present in the infections, but the temperature is never or rarely high. Mortality is low, not exceeding 2 per cent., and it is usually only in the young, the old, or the debilitated that the attack ends fatally. The infectivity-rate is generally high, and often all those who consume the incriminated food become ill. Occasionally some may escape, suggesting an uneven distribution of the infecting organism in the foodstuff.

THE SALMONELLA GROUP

The causal organism is usually a bacterium belonging to the salmonella group, which in morphology and general characters are very like the paratyphoid bacilli. In fact, *B. paratyphosus* B (not A, which causes a typhoid-like disease only) may produce an acute food-poisoning, but this is very rare and need not be considered here. They are small non-sporing bacilli of variable length, multi-flagellate and actively motile. All ferment glucose, usually with gas production, and they fail to ferment lactose and saccharose and to clot milk.

The first member of the group to be recognised was the *B. enteritidis* of Gaertner, met with in a food-poisoning outbreak, and the second most frequent causative organism of food-poisoning outbreaks. Since then, some five and twenty or more types have been found to cause food-poisoning; these can be differentiated from one another only by exact serological tests, the commonest of all being *B. aertrycke*. W. G. Savage has compiled a list of 11 types of salmonella met with in 121 food-poisoning outbreaks in Great Britain, 1919–1931, *B. aertrycke* being found in 76 and *B. enteritidis* in 14. Animals also suffer from salmonella infections; some of the causative organisms are not known to be pathogenic to man—e.g., *B. abortus equi* and *B. pullorum*; others attack man as well—e.g., *B. aertrycke*, common as a cause of epidemics among laboratory mice, *B. enteritidis* occurring in wild rats, and *B. suipestifer* in swine. The viruses employed for the extermination of rats are cultures of strains of salmonella having a particular virulence for rats. Salmonella infections are likewise not uncommon in birds, e.g., ducklings, and duck's eggs may, perhaps, acquire infection from this source, for W. M. Scott has found that if eggs were smeared with culture and kept moist, the organism penetrated into the interior within a few days, and Rettger and Scoville have found the organism in the ovary of infected birds.

With regard to the vehicles of infection in the 121 food-poisoning outbreaks mentioned above in which living salmonellas were isolated, 21 were due to minced meat foods, 16 to meat pies, and 12 to milk and milk products. Canned foods accounted for 8 only—they are not the commonest vehicles of food-poisoning, as is so frequently assumed. It is of interest that eggs were the vehicle in 7 outbreaks, duck's eggs accounting for 6 of these. The more frequent incidence in connexion with duck's eggs may be accounted for by the habits of this bird, which lays its eggs promiscuously on the ground, where they become fouled and are kept moist.

The path of infection is difficult to trace and, according to Savage, cannot be ascertained in more than 10 per cent. of the outbreaks. A chronic human carrier seems to be very infrequent, or at any rate is rarely discovered. Only in 7 among some 450 food-poisoning outbreaks in Los Angeles, 1928–32, were human carriers positively incriminated. This fact is noteworthy considering the importance of the carrier in some human diseases. An outbreak is occasionally due to an infected or a diseased animal; now and then a rat virus is responsible. Fly infection has been suggested, and seems a likely cause in some instances but has never been proved. Large gaps obviously exist in our knowledge of the paths of

* There is one possible exception to the statement that animals are never carriers of typhoid infection. In Greenland, where typhoid fever is not uncommon, according to G. Krogh-Lund the Eskimo dogs have the unpleasant habit of eating the fæces of their owners; dogs may thus become carriers of the typhoid bacillus for a time and transmit the infection.

infection in salmonella outbreaks, gaps which it is highly desirable to fill because of their possible preventive import.

Savage directs attention to five outstanding factors in connexion with salmonella outbreaks.

(1) *Food manipulation.*—Minced meat foods, meat pies, and foods which are subjected to some manipulation like pressed and salted beef, stews, ham, and bacon, were responsible for 47 out of the 121 outbreaks he mentions.

(2) Manipulation often involves keeping, with warming and cooling—conditions particularly prone to favour bacterial multiplication should infection have taken place.

(3) Any jelly or broth formed in the course of the manipulation favours bacterial multiplication.

(4) Manipulated foods prepared for sale to the public are often produced in unsuitable places under unsuitable conditions.

(5) Temperature appears to be of importance, for food-poisoning outbreaks exhibit a seasonal prevalence, the majority occurring in the summer months. The higher temperature of summer would naturally favour bacterial multiplication.

Great variation in the virulence of strains of salmonella exists and Savage makes the suggestion that virulence tends to be increased in summer. Further, there may be increased human susceptibility in hot weather, for gastric acidity is probably reduced thereby, and experimentally in guinea-pigs it is found that salmonella establishes itself more readily in the intestinal tract in animals that have been kept at a raised temperature for some hours.

DYSENTERY BACILLI

Besides salmonella, dysentery bacilli are occasionally the cause of acute food-poisoning outbreaks. Savage and Bruce White stated as long ago as 1925 that these organisms may give rise to food-poisoning outbreaks with characters not distinguishable from ordinary salmonella group outbreaks.

An outbreak of food-poisoning due to dysentery bacilli occurred in London last October (10 cases with 2 deaths). The vehicle of infection was pease pudding made from dried peas, and the outbreak was confined to those who consumed a particular batch of pudding on Oct. 7th. The same peas were used for earlier batches, which were consumed without harm, so that the infection was obviously something which affected only that particular batch of pease pudding. Examination of the peas yielded negative results, but dysentery bacilli of the Sonne type were found in large numbers in the remains of the pease pudding. The evidence at the inquest suggested that a small girl had been the carrier of the bacilli for some time, and that she had dipped her fingers into the pudding when taking it from the dish in which it was served. The symptoms were those usually associated with food-poisoning—viz., acute onset with vomiting and abdominal pain, passage of blood and mucus in the stools, and high temperature.

Passage of blood and mucus in the stools, an unusual feature of food-poisoning by salmonella, might suggest the possible rôle of dysentery bacilli in a food-poisoning outbreak.

OTHER ORGANISMS

Other micro-organisms have been suggested as causes of food-poisoning, and doubtless the list will be added to in the future. An outbreak in Milwaukee seems definitely to have been associated with *B. cloacæ*, a coliform organism met with in sewage, the vehicle being cream-filled pies. *B. proteus*, a widely distributed putrefactive organism, has several times been held responsible for food-poisoning outbreaks, but the evidence is inconclusive.

Outbreaks due to Toxic Bacterial Products

Outbreaks due to the ingestion of toxic bacterial products (excluding botulism, which is in a class by itself) form a group with fairly clear-cut features. The incubation period is short—two to four hours usually—that is, longer than if a chemical poison were the cause, but much shorter than following infection with living salmonella. The symptoms are usually severe—more so than those accompanying salmonella infections—and yet are almost always followed by rapid recovery. The foodstuff implicated appears generally to be sound and unaltered, and is either sterile, or is free from pathogenic forms, and it is rare to find agglutinins in the blood of those attacked. In contrast to salmonella infections a large proportion of the outbreaks due to intoxications are due to canned foods; according to Savage, in 70 toxin outbreaks in Great Britain between 1919–1931, 58, or 83 per cent., were due to canned foods. Another difference is that the seasonal incidence does not exhibit the excess in the summer months characteristic of salmonella outbreaks, and it is noteworthy that again and again an outbreak follows close upon the opening of the tin, so that it cannot be caused by infection after opening. Savage regards this class of food-poisoning as being due to salmonella toxins—i.e., he holds that there has been an infection of the foodstuff with salmonella and that the organism has been destroyed in the canning process, but not its toxin—and he believes he has accumulated a certain amount of evidence in favour of this explanation. Others, however, do not accept the theory that salmonella produces toxin, or hold that if it does the toxin would be destroyed in the canning process.

Verder and Sutton gave to 2 volunteers heated custard culture of a recently isolated strain of *S. enteritidis*, and and to 5 other volunteers heated or filtered washings from similar cultures, and none became ill. On the other hand, another person who partook of custard culture heated insufficiently to kill many of the organisms became definitely ill, and monkeys became ill only when the living organisms were ingested.

Staphylococci may cause food-poisoning by intoxication. Considerable attention has of late been directed to this form of food-poisoning in America, but I am not aware that any outbreak in this country has been traced to these organisms, though it seems possible that some of the toxin outbreaks recorded by Savage and ascribed by him to salmonella toxin may be due to this cause.

Outbreaks associated with a staphylococcus forming yellow pigment have been recorded by Dack and his collaborators in 1930 (Christmas cake), Jordan in the same year (cheese), Jordan and Hall (chicken gravy), Jordan in 1931 (cake), Tanner and Ramsay in 1932 (milk), and McBurney last year gave an account of a considerable and characteristic outbreak caused by the same organism. Chocolate éclairs were the vehicles, served at dinner to women students, and altogether 60 to 70 per cent. of the 325 persons who ate éclairs were attacked; none who did not eat éclairs was attacked. There were 150 cases, of which 75 were severe, the symptoms appearing in two to three hours, and comprising nausea, salivation, abdominal pain, vomiting, extreme prostration, profuse diarrhœa, and chills; all those attacked recovered. The yellow staphylococcus was isolated from the éclairs, and the filtrate of cultures caused similar symptoms in volunteers.

Ordinary laboratory animals are unaffected by the staphylococcus toxin, but in rhesus monkeys much the same symptoms are produced as in man. Staphylococci being such widely distributed organisms, it may be asked—how is it that staphylococcus-toxin poisoning is not more frequent? The answer is that probably particular conditions are necessary for the production by the staphylococci of toxin in sufficient amount to prove harmful. Thus ordinary cultures of *Staphylococcus aureus* contain little or no toxin, but Burnet and others have shown that potent toxin may

be extracted from cultures of some strains by growing them in an atmosphere containing 20–25 per cent. of carbon dioxide. Moreover, not all strains of staphylococci form the enterotoxin of food-poisoning.

The filtrate of staphylococcus cultures contains several toxic substances, which may or may not be distinct toxins; these are hæmolysin, leukocidin, dermotoxin, lethal toxin, and enterotoxin producing food-poisoning symptoms. Woolpert and Dack tested four strains of *S. aureus* for toxin production, and found that No. 8, a food-poisoning strain, and No. 37, from the throat, both formed hæmotoxin, lethal toxin, dermotoxin, and enterotoxin; No. 42, doubtfully associated with food-poisoning, produced hæmo-, lethal, and dermo-toxins, but little enterotoxin; and No. 87, from chronic osteomyelitis, produced little of any of these four toxins. It seems probable that the various toxins are distinct substances, for Jordan and Burrows have found that the enterotoxin is not identical with the hæmotoxin and does not produce a skin reaction.

BOTULISM

A word must be said respecting botulism, the most dreaded of the toxin types of food-poisoning. Although outbreaks are not infrequent on the continent and in America, there has happily been only one authenticated in this country, that of Loch Maree in 1922 with the death of all the eight attacked. Botulism is caused by the ingestion of toxin that is resistant to digestion and has been formed by the growth in the food of an anærobic bacillus, *Cl. botu-linum*. Botulism differs from the ordinary forms of food-poisoning in that gastro-intestinal symptoms are absent or insignificant, there is no pain, and temperature, pulse, and respiration are unaffected until near the end. Dizziness, double vision, nystagmus, dilated pupil, and difficulty in chewing and swallowing are prominent and early symptoms, and the case-mortality is high—60 or 70 per cent. or more. The vehicle may be either a flesh or a vegetable food, but it has always been preserved or pickled in some way, and kept for a time before consumption. Infection of the food with *Cl. botulinum* is derived from the soil in which it exists in the form of resistant spores. The organism itself has not the slightest power of invading the tissues, and botulism is entirely due to its toxin.

"PTOMAINE POISONING"

We formerly used to hear a good deal about "ptomaine poisoning." This was supposed to arise from tainted food in which as a result of decomposition poisonous alkaloidal substances were formed. There is little real evidence that this happens, and ptomaine poisoning is now discredited. From experimental work by Savage, it would appear that food so tainted by ordinary decomposition as to be poisonous would also be so bad that no one would eat it.

Problems of Prevention

AVOIDANCE OF HANDLING

It is clear that general cleanliness in the production and in the handling of foodstuffs must be a safeguard against many of the infections that may be conveyed by food, particularly some of the bacterial ones, and in this respect progress has been made during the last 20 years. The diminution of human contact and handling of foodstuffs, and the widespread use of machine manipulation for packing and wrapping of the product is also satisfactory, since often pathogenic organisms gain access to food through the agency of infected human beings. Much more, however, might be done in this direction; for example, carcasses and portions of meat loosely enveloped in none too clean sacking are still to be seen in partially covered vans and at destination are carried into the store on the shoulders and backs of the porters. The exposure of food products in open windows and stalls, and their handling by all and sundry is still far too prevalent.

In this connexion it is of interest that last year the municipal council of Paris requested the Academy of Medicine to express an opinion on the subject of the protection of foodstuffs exposed for sale. The Academy recommended that bread and cakes should be wrapped in transparent coverings, and that meat and fish should never be exposed outside shops. Protection of fruit was recognised to be more difficult as purchasers like to test by handling, but simple washing an hour or two before use was recommended.

Most people would, I think, regret the passing of the small privately owned shop or business, but from the hygienic viewpoint there can be little doubt that the large stores have much to commend them. They are able to introduce hygienic fitments, cold storage and the like, and the quicker and larger turnover enables the food-supplies to be fresher, with less hesitation in scrapping the stale.

REFRIGERATORS

By means of various small refrigerators now to be had, cold storage has been brought within the reach of most households and small shops. The function of a refrigerator is to retard the growth of bacteria and moulds which find their way on to the surface of meat, fish, and other foodstuffs, and thus to prevent these from "going bad." Should pathogenic forms like salmonella have gained access, their growth and multiplication would similarly be prevented, and inasmuch as a certain minimum dose of organisms is probably necessary for the pathogenic effect to be manifested, cold storage would tend to diminish the occurrence of food-poisoning, and this is especially the case with manipulated foods, such as sausages and potted meats. Savage points out that in salmonella outbreaks due to milk, in which the organism must be pretty uniformly distributed, the infectivity-rate is only 40–50 per cent., suggesting that the alimentary tract can frequently dispose of a considerable number of these organisms without harm. But it should be clearly recognised that if meat has already become heavily infected, ordinary refrigeration cannot prevent its rapid decay.

There are also æsthetic reasons for maintaining cleanliness in food production and handling, and I believe that the æsthetic sense of the people has become more developed. Dung from healthy animals in milk, and street dust on meat, vegetables and fruit, bread and cakes, may be quite harmless, but such happenings offend our sense of what is right and proper, and no consumer should be exposed to the unpleasantness of eating food that he would not have chosen had he known its history. As E. O. Jordan puts it, "the clean and appetising production, preparation, and handling of food is a worthy object in itself."

Preventive measures against diseases that may be conveyed by food will naturally vary for different infections.

INSPECTION OF MEAT.—COOKING

In respect of certain infections derived from meat, such as tuberculosis and some of the helminthic infections, efficient inspection is a considerable safeguard. This involves the extension of municipal abattoirs and the abolition of privately owned slaughter-houses. Incidentally, humane slaughter of the animals is more likely to obtain in public than in private slaughter-houses. Some advocate the exten-

sion of the municipal slaughter-house system so as to make the scheme regional and controlled by a National Slaughter-Houses Board. J. H. Jones, in a recent Benjamin Ward Richardsom lecture, pointed out that the present municipal slaughter-houses compete with private ones and are almost always run at a loss. They are practically a collection of stalls utilised by private butchers, and neither private nor public slaughter-houses utilise by-products to the full. Under a national and regional scheme he believes that these defects would disappear, and that efficient inspection of meat would be enormously facilitated.

Mere naked-eye inspection, while sufficient to detect tuberculosis, fluke infection, and "measles," fails to detect trichinosis. This disease never seems to have been prevalent in this country, probably because we do not consume pig meat uncooked, but in Germany, where raw ham is commonly eaten, trichinosis was formerly a serious problem. It has been stamped out by microscopical examination of all pig meat and condemnation of that infected. Cooking of meat, and for that matter of all foodstuffs, is a considerable safeguard against infection and if adequate would destroy all infection. It must be noted, however, that even in a properly cooked joint, if it weighs more than say five or six pounds, the temperature in the interior seldom reaches as much as 140° F., which is insufficient to sterilise.

Cooking is important in other connexions. Those who know would not dream of eating uncooked vegetables in a cholera district; again, cockles properly cooked should not transmit typhoid fever, but the cooking to which they are subjected is commonly quite inadequate. Shell-fish to be eaten raw should come from layings uncontaminated with sewage, and in this matter the Fishmongers Company exercise a careful and beneficent supervision. Mussels are now being "purified" by chlorination. As regards fæcal and sewage pollution, safeguarding the sources of water-supply, and treatment of the water by storage, filtration, and chlorination are most important, but the existence of the healthy carrier renders the problem of complete protection a very difficult one in these and in other infections.

DETECTION OF CARRIERS

It was found after the war that "contact infection" with the amœba of amœbic dysentery is not uncommon, some 3 to 4 per cent. of soldiers who had never been out of this country being "contact carriers" and harbouring the amœba. The importance of the carrier in the spread of infection is demonstrated by the recent outbreak of amœbic dysentery in Chicago.

In August last year cases of amœbic dysentery were notified in Chicago and the patients were found to have eaten at a particular hotel. The staff of food-handlers, numbering 364, at this hotel were then examined and 15 clinical cases of amœbic dysentery and 11 carriers were found among them. Further examinations a little later revealed more carriers among the staff, and among 498 other persons not food-handlers about 100, or 20 per cent., had the amœba in their stools. The infection was probably caused by a carrier who had previously been employed at another hotel where cases of amœbic dysentery had occurred in 1927. Immediate measures of prevention were adopted, consisting in the isolation and treatment of all cases and carriers among the food-handling staff, strict hand-washing and disinfecting regulations, together with cleansing and repainting of premises and routine examination of food-handlers. Owing to the large number of persons visiting the World Fair at Chicago at the time, about 100 cases of amœbic dysentery from among them were traced in other States. In amœbiasis the only protection for the public lies in the detection of every infected food-handler and the elimination of such persons from this occupation. The outbreak in Chicago affords a marked example of the value of notification in the control of certain infectious diseases.

PASTEURISATION

Milk infections, in particular typhoid, scarlatina, and diphtheria, especially the last two, are frequently caused by contamination from carriers, and it is difficult to see how the carrier can be completely eliminated. In the enteric infections and diphtheria it is now customary to examine patients before discharge for the presence of their infecting organisms, so that the carrier state, if established, is at least known and the incriminated persons labelled. Even this safeguard fails, however, in contact carriers who have acquired infection without ever being ill. Medical supervision of all dairy employees is much to be desired, but all such safeguards will fail at times and we are almost forced to the conclusion that compulsory and adequate pasteurisation of all milk and its distribution in sealed containers is the only complete safeguard against infections emanating from human sources and those derived from the cow herself.

This subject has been dealt with by Dr. Hamill in a previous lecture, but I would like to emphasise what he stated—that the reason for the high incidence of tuberculous infection in ordinary milk is that it is the mixed milk of at least several cows, and if one of them is excreting tubercle bacilli the whole bulk of the mixed milk becomes infected.

The present practice of forwarding quantities of milk from the farms to London in large glass-lined road or rail tanks was designed, among other things, to replace the unhygienic churns, and admirably fulfils this end. Unfortunately, this very hygienic method has much increased tuberculous infection in milk, for these tanks, which hold some 3000 gallons, contain the mixed milk of so many farms that some of the animals are sure to be infected. Thus, E. T. Minett and E. J. Pullinger found the tubercle bacillus in all of 43 samples of raw rail-tank milk examined, and the London County Council in 49 out of 59 tank samples examined. It is estimated that 40 per cent. of London milk now arrives in tanks, so that tuberculous infection is verywidespread, but fortunately the whole of the tank-milk coming to London appears to be pasteurised or sterilised, and 90 per cent. of all London milk is pasteurised.

Adequate pasteurisation seems to be a complete protection against infections present in milk, for Minett and Pullinger found that of the 43 raw tank samples yielding tuberculous infection by the guinea-pig test, none of the corresponding pasteurised supplies contained living tubercle bacilli. The same holds good for undulant fever and streptococcal infections of milk, which are very prevalent, and the enteric, dysentery, and diphtheria bacilli are also killed.

It is satisfactory to learn from the same investigators that Certified and Grade A (T.T.) milks are almost free from tuberculous infection, though abortus and streptococcus infections are frequent.

For pasteurisation to be efficient, much depends upon the adequacy of the process. The temperature preferred for pasteurisation is about 143° F. maintained for half an hour, and should the temperature fall a degree or two below that named the process will not be efficient. The plant, therefore, needs to be of the best, with proper automatic temperature recording and control. The Reorganisation Commission for Milk say:—

"We hold strongly that there should be strict official control, not only of the bacterial content of the milk after pasteurisation, but also of the process itself. . . . We regard thermostatic control as essential and consider that the temperature charts should be available for inspection by the local authority." (Report, par. 78, p. 90.)

At present, however, local authorities have no power to control the process, except in the case of

milk which is sold under licence as "pasteurised milk."

SOUND MATERIALS AND CLEAN PREMISES

With regard to the prevention of food-poisoning from meat products—and it is "manipulated" meat foods that are so liable to give it—the use of fresh and sound materials is essential, and also their protection from contamination of all kinds. In this regard, the use of rat viruses in food factories and stores needs caution, though it is certainly most important to rid such premises of these rodents. The buildings should be adapted for their purpose and should be kept scrupulously clean. The re-cooking of unsold products is highly undesirable; a quick turnover, with scrapping of the stale, are considerable aids in the prevention of food-poisoning. Canned foods of good brands, even though not completely sterile (and Savage found that 62 per cent. of perfectly good tins are not sterile) are generally harmless. The formation of toxic products in canned foods may depend in some measure on the length of time that has elapsed between preparation and consumption, and the general adoption of some method of dating the preparation of the tins would be advantageous.

Authorisation to register and inspect food factories and premises used for the manufacture or sale of ice-creams and similar commodities, and for the sale and manufacture of sausages or potted, pressed, pickled, or preserved meat, fish, or other foods intended for sale is included in the London County Council (General Powers) Bill of 1932, which became operative last July, and if these powers are enforced they should do much to prevent food-poisoning.

Conclusion

Food-poisoning is a compulsorily notifiable disease in London. Provided notification is followed by skilled investigation nothing but good can result, even if some mistakes are made, for we are still very ignorant concerning many of the problems of food-poisoning. In any attack or outbreak information should be collected so far as possible concerning (1) the nature of the vehicle of infection or intoxication; (2) the nature of the causative agent, whether bacterial or otherwise; (3) if bacterial, the reservoir from which infection was derived; and (4) the path by which the bacterial agent was conveyed from the reservoir of infection to the vehicle. It is particularly with regard to this last item that knowledge lags.

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SPECIAL ARTICLES

MEDICAL CARE IN SOVIET RUSSIA

(BY A CORRESPONDENT)

THE plain man in search of trustworthy information about contemporary Russian life finds difficulty in getting it. This is not because of any lack of printed matter, for the output of books on Russia is enormous. The difficulty is to find publications that contain a sufficient body of data on the particular subject on which information is desired, without arousing suspicions that the data have been selected to support preconceived judgments for or against the present régime. The book[1] recently issued by Sir Arthur Newsholme and Dr. John A. Kingsbury, which is based on inquiries made by them in August and September, 1932, fulfils these conditions and may be recommended to all who wish to know what is now being done in Russia in preventive and curative medicine.

The visit of the authors to Russia was made to continue the investigations, extending over several years, that Sir Arthur Newsholme has carried out in many European countries for the Milbank Memorial Fund, the results of which are embodied in the three volumes of his "International Studies on the Relation between the Private and Official Practice of Medicine" and a fourth volume, "Medicine and the State." In the Russian inquiries he was joined by the secretary of the fund, Dr. Kingsbury, who was commissioner of public charities in New York City in Mayor Mitchell's reform administration, and has for many years been one of the leading social workers in the United States. The authors travelled 9000 miles in Russia, visiting the more important towns from Leningrad in the north to Tiflis in the south, and inspecting a large number of hospitals, clinics, sanatoria, convalescent homes, and other institutions. As experienced investigators they were fully alive to the difficulties of collecting precise data in a country in which the investigator unfamiliar with the language must put his questions through an interpreter who is always a government official and sometimes a member of the communist party. They realised also that they were being shown the best of what exists in Russia; but they point out that this is the usual experience of foreign investigators in any country, and they add:—

> "But when this best was seen in many cities visited by us, and when it was everywhere frankly stated that the arrangements were not yet complete, and that the dearth of doctors made more adequate provision difficult for a few years; and when we were told openly of the great difficulties which were being experienced in extending the medical provisions of cities to the vast rural communities of Russia and of the only partial success achieved in overcoming these difficulties, we were forced to the conclusion that we were not being victimised by a 'window dressing' display; and that, indeed, a marvellous reformed and extended medical service had been organised in Russia, the methods and procedures of which the rest of the world would do well to study."

ORGANISATION OF MEDICAL SERVICES

In "Red Medicine" the reader will find a most interesting account, mainly based on direct personal observation and profusely illustrated with excellent photographs, of what is being done to provide medical care in Russia at the present time. The most distinctive feature is that every doctor is a State official; private practice is not forbidden, but it is little in demand and most doctors have no time to give to it. A few doctors, chiefly consultants, retain some private practice, but their number is diminishing. The doctors' salaries, which are paid by the government, are graduated according to length of service and the nature of the work done. Special salaries are paid for exceptional services. It is stated that in 1931 there were 76,000 doctors in Russia, of whom a very large proportion were women. The number is insufficient, and many of the doctors are overworked. With a few minor exceptions, all public treatment is

[1] Red Medicine: Socialised Health in Soviet Russia. By Sir Arthur Newsholme, K.C.B., M.D., and John Adams Kingsbury, LL.D. New York: Doubleday, Doran and Co. 1933. Pp. 324. $2.50.

given without charge to the patient. Another distinctive feature is the concentration of medical practice in institutions—dispensaries, polyclinics, hospitals, &c.—in which the doctors work as members of a team; domiciliary treatment, which is not given except to those unable to attend as out-patients, is undertaken by dispensary doctors, who are assigned to districts. Apparently a considerable measure of success has been secured in coördinating the work of the various institutions into a unified and efficient system of medical services. Sir Arthur Newsholme and Dr. Kingsbury were much impressed by the high standard of equipment and efficiency reached in the numerous hospitals they visited. "We found," they say, "new hospitals with the newest and best appliances and without any evidence of the relative poverty which we would expect in Russia under present circumstances." Anti-tuberculosis work in particular has been greatly developed. There are many tuberculosis dispensaries; Moscow has 24 with 226 whole-time doctors. "But the astonishing fact is the vast provision of convalescent home and sanatorium accommodation, probably larger in proportion to the population than in any other country." This provision has been much facilitated by the confiscation and conversion into residential institutions of large houses formerly occupied by the aristocracy. Livardia, in the Crimea, once an Imperial palace, is now a convalescent home, housing, with its subsidiary buildings, about 1500 inmates. In 1931, it is stated, there were in Russia 724,000 beds in sanatoria and convalescent homes. Maternity and child welfare, which is regarded as of basic importance, has been developed on special lines. In view of the extensive industrial employment of women there is an enormous demand for creches, which have already been provided on a large scale and are rapidly increasing. There has been a great increase also in maternity beds; in the large towns the great majority of confinements take place in hospitals. In the rural areas the contrary is the case; and since there is a shortage not only of doctors but also of trained midwives, most parturient women in the country are still attended by their neighbours.

HEALTH INSURANCE

A distinctive feature of the Russian health insurance system is that the insured person pays no contribution; the cost is borne entirely by the employer, who is usually the State. Insurance does not include the agricultural workers, who form the vast majority of the population, nor the disfranchised class—the remnants of the aristocracy and the old bourgeoisie. The rate of sickness benefit paid to a disabled insured person is equal to his full wage, and is paid until he recovers complete capacity or becomes permanently incapacitated, when he receives an invalidity pension, which varies from one-third to two-thirds of his wage. Sickness benefit is not paid beyond ten days unless the medical referee, after consultation with the certifying doctor, is satisfied that the patient is incapable of work. Persons receiving sick pay are visited by a member of their shop committee, and there is said to be little malingering. Medical treatment is not provided by the insurance carriers, but by the local health authorities as part of the provision of medical services for the general population. Special attention is, however, given to the health of factory operatives, who before beginning work are inoculated against small-pox and typhoid fever, and subsequently come under systematic medical supervision.

CONCLUSIONS

The impression left by a perusal of this attractive and informative book is that in the large towns of Russia there has been built up with remarkable rapidity a coördinated, well-equipped, and efficient system of institutional medical services, preventive and curative. In the provision of domiciliary treatment, however, comparatively little progress has been made, and there is still much need for medical care in the rural areas, which contain four-fifths of the total population. This is due chiefly to the lack of skilled personnel—doctors, midwives, and nurses—and strenuous efforts are being made to train additional workers. Moreover, the medical services are not, as in this country, based on a secure foundation of civic and domestic sanitation—water-supply, sewerage, house drainage, and the like. The prevalence of dysentery, typhoid fever, typhus, and malaria in Russia shows that in the field of sanitation there is much spade work to be done; and the "liquidation" of tuberculosis, which is one of the main objectives of Russian public health administration, can hardly be accomplished without radical improvements in housing conditions. We learn from "Red Medicine" that: "Even the new apartment houses are terribly overcrowded. More than one room to a family appears to be exceptional, and the single room may be shared by sub-letting." These conditions are, however, realised by the health administrators, and the housing problem in particular is being vigorously attacked.

Sir Arthur Newsholme and Dr. Kingsbury have published this account of their Russian inquiries at an opportune moment. At the present time the problem of providing adequate medical care for all who need it has become urgent in America, and it cannot be said that it has been completely solved in this country, in spite of our health insurance system and recent development of contributory schemes for hospital treatment, and of public medical services for the non-insured. To the solution of the problem Russia has made a novel and distinctive contribution, which, whatever may be said against it, contains elements that provoke thought, and deserve to be carefully studied by all who are interested in promoting the health of the community.

RISKS OF CHILDBIRTH IN INDIA

AN INVESTIGATION IN MADRAS

Dr. A. L. Mudaliyar, F.C.O.G., has just reported (Government Press, Madras) his experience in the city of Madras, during a twelve-month, when the total births were 26,207 and 436 maternal deaths were discovered. The actual number of deaths may have been greater, although the records of the health officer showed only 293, for there is no proper system of death certification. On these figures the maternal mortality of childbirth in Madras is not less than 16·6 per thousand live births. Facilities in the way of hospitals and antenatal clinics were not lacking, and the mortality in rural areas must be much greater. This investigation was carried out much on the lines of the departmental committee's inquiry in England. In classifying the causes of death, 26·4 per cent. were ascribed to sepsis; two-thirds of these 115 deaths from sepsis occurred in women who had had a natural delivery; and in only 13 is there any suggestion that delivery by forceps, employed in 31 cases, had been difficult. Post-partum hæmorrhage is credited with 9 per cent. of the deaths, and eclampsia with 8·7 per cent. There seems to be a tendency for eclampsia to increase; in 1931 the hospitals had a mortality-rate for eclampsia of 20 per cent., being

double that of the previous year. Anæmias accounted for 11·5 per cent. of the deaths and it is only routine blood examination at the antenatal clinics which can result in detection early enough for effective treatment. Ruptured uterus stands at the high figure of 3 per cent. Reviewing the whole series Dr. Mudaliyar finds a "primary avoidable factor" in 233 of the cases, or 53 per cent. of them, and he allots this factor thus:—

Absence of or faulty antenatal care	101
Lack of reasonable facilities	32
Error of judgment	38
Negligence of patient or friends	62

It will be noted that the share taken by "error of judgment" is put lower than in the English departmental report. In making his recommendations Dr. Mudaliyar recalls that the city of Madras already has a well laid-out scheme of maternity relief, but not the rest of the presidency. His suggestions for improvement are on a line with those of the English departmental committee but he would like special inquiry into the various conditions complicating pregnancy and parturition in the tropics; the local government should, he thinks, offer research scholarships for this purpose.

CHILD MOTHERS

The Madras figures are specially high for the age-group 15–19, but the difficulties likely to confront any government in contending against such old-established customs as child marriage are very great. In 1928 the Government of India appointed a strong committee, almost entirely Indian in composition, to report on this subject, and in 1929 the document known as the Joshi report appeared; its publication led to the passing of the Sarda Act in restraint of child marriage in the same year. The hope that this Act had provided a definite check to the evil was not fulfilled. The Census Report for 1931, which reached us a few weeks ago, revealed a distinct *increase* instead of a decrease of child marriages; and this is believed by many who have followed the movements and counter-movements to be attributable to the Sarda Act itself. The Joshi Committee had urged that before any Act came into force there should be an extensive campaign of publicity and education. The Act, accordingly, provided for an interval of six months between its passing and its coming into force, in which the campaign could take place. The interval was there, but not an adequate campaign. During the interim all sorts of rumours went about, and interested parties created such a panic that a perfect spate of child marriages took place. About three million girls under age were married during that time. Even when the Act came into operation it was not enforced. It is generally believed that child marriages continue to be celebrated as frequently as ever throughout India; but only 473 prosecutions have been brought in 29 months, 167 being successful, and in only 17 of those 167 convictions has any penalty other than a fine been imposed. It is clear that the evil of child marriage, though it has been faced, has not been defeated. Whatever form the new constitution of India may take, it may be hoped that the maximum possible attention will be given to the welfare of the mothers of the race.

SCANT ASSISTANCE

According to the latest report of the director-general of the Indian Medical Service the maternal mortality-rate in Bengal is very nearly 50 per thousand, and it is even higher in some parts of Assam. Taken over the country as a whole he estimates it to be 24·5, that is to say six times as high as in England. This figure would imply that every year some 200,000 women die in childbirth in India—a heavy proportion of the deaths being those of child mothers. There are more than eight million births a year in India, hardly any trained midwives exist, and only some 600 women doctors to serve a female population of 131 millions, very few of whom are willing to see a male doctor except at the last extremity. The few women's hospitals available for maternity cases receive scant attention and scantier support in almost every province. The fact that under all the variants of the new constitution of India it is proposed that matters relating to public health should remain "transferred" subjects, that is, it should still be under the jurisdiction of the provincial subjects, makes it important to arouse more local interest especially among Indian women in public health propaganda, and the first step to this end should be the allocation of more money for this purpose. While it is encouraging to note that in the Punjab, for instance, during 1932, an Act was passed for the registration and training of nurses, health visitors, midwives, and dais, it is unfortunate that the comprehensive scheme for providing women's hospitals should still be held up for want of money.

UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

IMPERFECT REPORTING OF VENEREAL DISEASE

THE public health service has for a number of years been engaged in making one-day surveys of various communities in the United States for the purpose of determining the number of cases of venereal disease under treatment at a given date. Questionnaires are sent to each doctor in the community and to each institution that may have inmates under treatment, precautions being taken to avoid counting the same person twice. At present the total population surveyed by this method amounts to about one-quarter of the entire population of the country. Estimates based on these studies indicate that 423,000 persons with early syphilis and 679,000 persons with acute gonorrhœa seek legitimate medical treatment each year. No estimate can be given of the numbers who treat themselves with patent remedies or who neglect treatment altogether. But at least the 1,100,000 patients who apply to physicians should be reported as suffering from contagious diseases. The numbers actually reported to State health departments, however, in the year ended June 30th, 1933, were 149,527 new cases of gonorrhœa and 234,647 new cases of syphilis. Emphasis is placed on the seriousness of this imperfect reporting in view of the development of modern epidemiological methods of controlling syphilis and gonorrhœa. As W. L. Munson points out (Amer. Jour. Pub. Health, 1933, xxiii., 797), no health officer would try to control an epidemic of typhoid fever by giving lectures on the disease. The sources and contacts of syphilitic infection can only be investigated as in the case of any other communicable disease if the active cases are reported.

INCREASING MORTALITY FROM DIABETES

Diabetes which a generation ago took twenty-first place is now tenth in order among the principal causes of death in the U.S.A. The increase in the total mortality-rate continues in spite of the fact that at ages below 45 years the death-rate from diabetes is decreasing for both sexes. It is in the older age-

groups and especially among older women that the increasing mortality is to be found. "To-day," Dr. L. I. Dublin writes, "more women over 45 years of age die of diabetes than of tuberculosis. In fact we know that from 2 to 3 per cent. of our present population will ultimately die of diabetes." It is a matter of natural astonishment that this increasing death-rate should be found in spite of the discovery of insulin and its clinical application. A part of the increase is perhaps apparent rather than real. C. Bolduan points to the change of population both as to age and racial structure. The decline of our birth-rate and the cessation of immigration both tend to increase the proportion of older people in the population. In New York City at least the relative increase of the Jewish population has also affected the diabetes death-rate. It is probable, too, that diabetes is more often recognised than in former years. Although Fehling's quantitative test for sugar has been available since 1848, it was not until nearly the end of the nineteenth century that routine tests of urine for sugar became common practice in American hospitals. "Undoubtedly," says Bolduan, "the general practitioner lagged far behind." And the teaching of the text-books that diabetes was a rare disease contributed to its non-recognition. Nevertheless, on the basis of samples taken by examining the results of routine urine tests on patients admitted to New York's hospitals for the insane, Bolduan is not convinced that there is any real increase in the diabetes death-rate. Dublin disagrees with him. Dublin thinks that the improved standard of living has resulted in more luxurious eating and less expenditure of physical energy; thus an increase in obesity, which is well known to be associated with diabetes. But how, asks Bolduan, can this explain the much greater apparent increase among women than among men? And is there any reason why the improved diagnosis should operate more forcibly in one sex that in the other? An interesting sidelight is thrown by a recent statistical study made by Dr. R. H. Britten, of the public health service, on 3037 medical examination records of men markedly under- or overweight for height and age. It is shown that overweight is associated with increased frequency of glycosuria at ages over 45, but not at ages under 45. Dublin's supposition that a part of the increase in the diabetes death-rate is due to increase in obesity and the observed fact that the increase is occurring in age groups over 45 years tally with Britten's observation.

MEDICINE AND THE LAW

Unregistered Person and Dangerous Drugs Charges

A FEW years ago a man named Powell was charged in a London police-court with having pretended to be a doctor of medicine and a surgeon. He had actually obtained an appointment as ship's doctor in a vessel bound for Australia; he made the voyage, attended members of the crew without ill-results, and on the return journey successfully treated the captain for cardiac trouble. Powell was again before the courts last week charged with offences under the Dangerous Drugs Acts and with obtaining drugs and serum by false pretences from a firm of chemists in Wigmore-street. It was alleged that on five occasions between Dec. 22nd and Jan. 1st he had telephoned to the chemists asking for drugs to be sent to a named railway station as they were wanted urgently. On each occasion he posed as a doctor, giving different names and addresses, calling for the drugs and signing for them in the name he had given. To give colour to his false pretences, it was suggested, he also ordered serum to be sent. On Jan. 1st, when he telephoned in the fictitious name of Dr. Humphries, his voice was recognised, a dummy packet was made up and sent to Ruislip station as requested. Powell was stopped at the station by a detective to whom he admitted his offence. At the Marylebone police-court it was stated that the accused had undergone serious operations and had suffered great pain for which he had been given morphia. The court missionary offered to take him on probation and send him to the country under medical supervision. The magistrate bound Powell over on probation accordingly.

Delay in Reporting an Accident at an Institution

An inquest was held last month on the death of Jane Brewer, aged 81, at Oster House, St. Albans, a public assistance institution. At 6 A.M. she had fallen to the floor, apparently in attempting to get out of bed. At 7 A.M. the nurse attendant came on duty and was told of the fall; Miss Brewer spoke of pain in the right leg; the nurse looked at it, saw nothing wrong but kept her in bed and reported the accident to the matron at 9 A.M. when the offices opened. She did not think the injury serious enough to be reported earlier. The matron examined the leg, which by this time could not be moved, and ordered that Miss Brewer be taken to the infirmary in another part of the buildings. Brought into the infirmary at 10.30 A.M., the patient was first seen by the deputy medical officer at 3 P.M., this being the earliest time at which he knew of the accident. He found her suffering from a fracture at the neck of the right thigh. Coroners are sometimes regarded as having a special duty to investigate accidents in public institutions; the inmates are not living in the midst of friends and relations, and public opinion likes to be satisfied that, as in this St. Albans case, the treatment has been free from any suspicion of carelessness or negligence. The Hertfordshire coroner, Mr. T. Ottaway, very properly directed his questions to the possibility of avoiding similar delay in future in obtaining medical attention. In entering a verdict of "death by misadventure," he said he was in no way complaining of the staff but he thought some arrangement might be made whereby the two hours' delay in reporting the accident might be eliminated another time.

In Utopia perhaps no such accidents would occur. Should they occur, a doctor would be summoned forthwith to ensure prompt diagnosis and treatment. If it afterwards appeared that there had been an interval of six hours between a fracture of the femur and the attendance of a doctor, the responsible authorities would doubtless diligently seek and gratefully receive any suggestions for perfecting the services which they exist to supply. But this is not Utopia. At the next meeting of the Hertfordshire guardians' committee, the chairman took exception to the coroner's observations, remarking that Mr. Ottaway "had chosen in his wisdom to rather 'play up' the house against the infirmary." "I think," he is reported to have said, "he had no business to play up one part of the institution against the other and tell the institution how to run its business." If common ground is to be found between the chairman and the coroner, they can perhaps agree that, when an unfortunate accident occurs, the question of early treatment is more important to the patient than the geography of the building.

CORRESPONDENCE

BATTLE OF THE BARBITURATES

To the Editor of THE LANCET

SIR,—As an anæsthetist, I cannot but be interested in the battle of the barbiturates which is at present being waged. With one exception, the article by Sir James Purves-Stewart and Sir William Willcox in THE LANCET of Jan. 6th (p. 6) proves nothing but that fantastically large doses of the barbiturates may be combated successfully by energetic measures. In this one exception death is attributed to the use of grs. 3 of nembutal, despite the use of some of the energetic measures which successfully revived a woman who had taken grs. 475 of another barbiturate with suicidal intent. I seldom use nembutal now, but it appears to be the drug, par excellence, to sting the Home Office experts to speech and print. Sir William Willcox, beyond incriminating nembutal as the main cause of death, gives few other details of this case. A published report of the inquest (Brit. Med. Jour., 1933, ii., 1051) supplies us with more evidence which is surely relevant to the cause of death.

The patient had had nembutal given to her a year before at a previous operation, presumably successfully, as she asked for it again. She was given nembutal, grs. 1½ the night before the operation. The next morning she was given morphia and atropine (dose not stated) and grs. 3 of nembutal by mouth. Half an hour afterwards anæsthesia was induced by ethyl chloride, and continued with open ether. The operation lasted two hours. After the operation omnopon (dose not stated) was given. The same afternoon a blood transfusion was performed. I cannot find any reference to transfusion as a remedy for barbiturate poisoning; I presume the transfusion was performed because of shock and anæmia following the operation. The next day the patient was found to have a blood-urea of 57 mg. per 100 c.cm. and died 51 hours after the operation with signs of pneumonia.

For this death nembutal is blamed. Surely, if a man drinks two cocktails, a bottle of whisky, and then sustains a blow on the head, it would be irrational to blame the resultant unconsciousness on the two cocktails! When nembutal is given by mouth the rate of its absorption from the alimentary tract varies within wide limits, and may be markedly delayed in the nervous patient. In this case the fact that ethyl chloride was used to induce anæsthesia suggests that the nembutal had not been totally absorbed, and the effect of the absorption of the remainder would necessarily be masked by the ether anæsthesia.

Three years ago I prescribed grs. 3 of nembutal to a patient three-quarters of an hour before the operation. As the patient was still wide awake when I arrived, I refused to proceed with the anæsthetic, and the operation was postponed until another day. An hour later the patient fell into a sleep which lasted four hours. I have not given nembutal by mouth, as a pre-anæsthetic, since that date. I have, however, given the barbiturates intravenously, in the form of pernocton or nembutal, in over fifteen hundred cases, and have not had a death, immediate or remote, or even a fright following their use.

The use of barbiturates intravenously, by producing the requisite depth of sleep in bed, has a definite place in making for safe anæsthesia, and, what is of almost equal importance, it reduces psychical trauma to a minimum so that the patient views the prospect of a future anæsthetic with equanimity instead of horror. The attitude of the present Home Office experts, if persisted in, is liable to postpone the progress of pre-anæsthetic medication with all its attendant advantages—not the least of which is *safety*.

I am, Sir, yours faithfully,

R. R. MACINTOSH.

Upper Brook-street, W., Jan. 15th, 1934.

THE PREVENTION OF CANCER

To the Editor of THE LANCET

SIR,—At first sight it would appear that I have no alternative but to agree with Mr. Barwell's pessimistic objections to my views on the prevention of cancer, since he has accepted my thesis and seems to have carried it to its logical conclusion. I think, however, that this dilemma is more apparent than real. The cancer population, if I may use that term, is composed of individuals having varying degrees of susceptibility. There are the highly susceptible people, who develop cancer as a result of a relatively slight degree of chronic irritation, and, at the other end of the scale, we have the less highly susceptible people in whom cancer develops as a result of a more prolonged or intense degree of chronic irritation. As I stated in my paper, we cannot hope to prevent cancer in the highly susceptible persons by avoiding the external carcinogenic conditions, but it should be possible to do so in the less highly susceptible, and the latter would not necessarily develop cancer elsewhere. If Mr. Barwell's opinion held good there would be no point in preventing occupational cancer, since this too picks out individuals who are more susceptible than the average. My contention is that cancer of the stomach should be looked upon as an occupational disease in so far as it is due, in a large number of cases, to external conditions which can be avoided, and which, even on the mere grounds of general hygiene, *should* be avoided. If one accepts that such external conditions exist, one should surely make an attempt to find out what they are. Having found out what they are, I cannot imagine anybody not doing his best to avoid them, and we shall then see whether this does or does not reduce the total incidence of cancer.

I agree entirely with Mr. Barwell that measures directed towards reducing the susceptibility to cancer would be another, and, perhaps, even better method of prevention. As I stated in my paper, I have been carrying out experiments along this line for several years, although as yet without success, but I imagine that even when it has been found possible to diminish the susceptibility to cancer, one would wish to avoid the external carcinogenic conditions in so far as they are known.

Mr. Barwell makes the further objection that "a patient cured from cancer is not rendered immune by the previous invasion," and states that there is "considerable clinical evidence" for this. I am not aware of the existence of this evidence. It is not sufficient to quote a number of cases where a second malignant new growth has made its appearance in a patient cured of a previous malignant neoplasm. I have dealt with this point in my paper; what we must know is whether such an occurrence in patients cured from cancer is more frequent, less frequent, or equally frequent as in corresponding age-groups of the rest of the population. For obvious reasons we must exclude those cases where the second growth appears in the same organ or tissue as the first one.

I take this opportunity of drawing attention to the work of Dr. A. F. Hurst,[1] published in his Schorstein

[1] THE LANCET, 1929, ii., 1023.

lectures, on the precursors of carcinoma of the stomach, and in his Alvarez lecture on the unity of gastric disorders.[2] I had unfortunately overlooked these publications when I wrote my paper. I regret this all the more as they answer to some extent Mr. Barwell's objections. Dr. Hurst not only regards cancer of the stomach to be a preventable disease, but he has already by his work supplied a good deal of the clinical evidence for which I asked. From his clinical investigations he concludes that "gastritis, gastric or duodenal ulcer, and carcinoma of the stomach could be prevented by the adoption of the simple hygienic measures required to avoid the exciting causes I have enumerated. It is, perhaps, too much a counsel of perfection to expect universal prophylaxis of this kind, but it might at any rate be provided for those people who can be recognised from their physical characteristics, or from their family histories, as being constitutionally liable to develop organic disease of the stomach." It is interesting that among the exciting causes he mentions bad teeth, imperfect mastication, and septic foci in the buccal and nasal cavities. I am, Sir, yours faithfully,

Jan. 14th, 1934. W. CRAMER.

To the Editor of THE LANCET

SIR,—I agree with Mr. Barwell that there is little chance of being able to prevent the occurrence of cancer by attempting to influence the extrinsic factors, and that the only hope lies in the possibility of attacking the intrinsic factor of susceptibility. The factor of susceptibility is the really important one and the extrinsic factor is merely the trigger that fires the mine.

We have recently learnt quite a lot about this intrinsic factor of susceptibility and its importance. It has been shown by Bittner, Loeb, and Strong [3] that pure strains of mice can be bred which are completely susceptible to transplanted cancer, in that there are practically 100 per cent. of takes, and also that a strain can be bred which are entirely insusceptible, in that a transplanted cancer will not grow at all. In these mice experiments it would appear from the results that the factor of susceptibility, or otherwise, is the all-important one. These mice had first been bred brother to sister for a number of generations to make sure that their genetic constitution was as nearly as possible identical. Observations on the pedigrees of human beings are of little value as there are no pure strains, and accurate observations over a number of generations are very seldom obtainable. But fortunately an observation has been made which gives an equally clear-cut result in humans, and is thus of considerable interest. McFarland and Meade [4] have collected 20 cases of tumours in homologous or uniovular twins. In every case the same kind of tumour was present in both twins in the same organ at approximately the same time, and no case could be found of an homologous twin with a tumour where the other twin had not also the same tumour. As the genetic constitution of homologous twins is identical, and it is quite certain that the environmental or extrinsic factors acting on the twins were different, since they would probably not be living together or even in all cases living in the same province or country—this seems to prove that the intrinsic factor of hereditary susceptibility to tumour-formation in human beings is of far greater importance than the extrinsic or environmental factor.

The factor of hereditary susceptibility does not seem to be for tumour- or cancer-formation as such, in any part, but only for tumour-formation in a particular organ or tissue. Thus the "buffalo" mice develop cancer of the mamma in about 90 per cent. of all females reaching a particular age, but the males do not develop cancer at all. The factor of susceptibility appears to be very specific to a particular tissue, and from a number of observations that have been made it seems very probable that it is specific to a particular age of the animal.

It would thus seem that the chances of being able to prevent cancer on the lines suggested by Dr. Cramer is not a very hopeful one. There is, however, one point worth noting. Where it is known that certain individuals have possibly inherited a susceptibility to develop cancer in a certain organ, then if such individuals are carefully examined, as regards that organ, at regular intervals, there is an excellent chance of the lesion being detected during the early stage, when it is curable.

I am, Sir, yours faithfully,

J. P. LOCKHART-MUMMERY, F.R.C.S.

Harley-street, W., Jan. 13th, 1934.

[2] Brit. Med. Jour., 1933, ii., 89.

[3] Bittner, J. J.: Amer. Jour. Cancer, Sept., 1932, p. 1144. Loeb, L.: Proc. Internat. Canc. Conf., 1928, p. 48. Strong, L. C.: Jour. Canc. Res., 1929, xiii, 103.

[4] McFarland, J., and Meade, T. S.: Amer. Jour. Med. Sci., 1932, clxxxiv., 66.

OSTEOPATHY

To the Editor of THE LANCET

SIR,—I have read with interest the letter which appeared over the signature of Dr. James Mennell in your issue of Jan. 6th, wherein he gives his summary of the present situation. He was good enough to quote from my letter to the *Times* of Nov. 23rd last. Had he read that letter more carefully there would have been no necessity for his summary, nor the need of his emphasising *his* interpretation of the training of an osteopath. That an osteopath is qualified in manipulation only is far from actual fact, and to substantiate my definition of *fully trained* I will quote Sir Robert Stanton Woods, who in his letter to the *Times* of Nov. 13th said:

> "The course of study which must be completed by a candidate for the diploma of Doctor of Osteopathy in any of the six main colleges in America is fully inclusive of that which is demanded by medical educational authority in this country, and the various examinations to be passed are comparable, in every essential respect, with many of those held for medical undergraduates here and elsewhere."

And I would further state that it is our contention that any practitioner of osteopathy should be required to qualify on such lines.

It might be of interest to both professional and lay readers if some of Dr. Mennell's statements are dealt with by one who has made a serious study of the osteopathic science. Dr. Mennell infers, as other medical writers have done, that the lay public seems to be more or less generally under the impression that manipulative treatment is only given by those who do not hold medical qualifications; but, as he also states, this is not so. In order, however, to be just, it must be remembered that it is the practitioner *not* holding medical qualifications who has emphasised the importance of manipulative therapy in relation to ill-health and has conducted his practice accordingly. Is it, therefore, surprising that the laity, after having received abundance of relief from disorders and ailments which qualified medical practitioners have either failed to diagnose or completely overlooked, should be impressed with the skill and vision of the osteopathic practitioner? It is obvious that the success of the osteopathic practitioners is being

brought more and more to the notice of the medical profession, and it is further obvious that owing to abundant evidence of the benefits to be obtained the public is turning more and more to the osteopath for alleviation of sufferings, many of which have in no manner been relieved by ordinary medical procedure.

That "osteopathy is a branch of physical treatment" is by no means correct because osteopathy as taught by the recognised schools is a complete science, incorporating in its curriculum all those adjuncts to the art of healing which have been proven to be scientific and beneficial in restoring and maintaining health. To say "it is a system of healing apparently almost regardless of pathological conditions" is still further from the truth than the statement made by Dr. Mennell, above quoted. The fully trained osteopathic practitioner is as well informed in pathological changes and their effects as any medical practitioner. Equally the osteopath knows and appreciates, as the result of his general training, that there are countless instances where manipulative therapy is unavailing. To say that this form of treatment in some cases is dangerous is true, and it is upon this point that the fully trained and qualified osteopaths in this country are pressing for a measure which will protect the public from those individuals who designate themselves osteopaths without having undergone the necessary training. It is only too obvious, with the increasing confidence which the general public is placing in the osteopathic practitioners, that steps must be taken to establish and maintain the standards required of the recognised, trained, and qualified practitioners.

Dr. Mennell had previously said "that it is a mistake to speak of the medically unqualified osteopath as untrained. This individual is frequently highly trained and often by his treatment produces striking results where the qualified man has singularly failed to give relief." Is this consistent with several remarks he has chosen to include in his letter under reply? For Dr. Mennell to suggest that the qualified osteopath (who has had a training similar in practically every detail to that of the medical man) must, like a masseur, work under the direction of a doctor is absurd. As members of a new profession we have something to offer which is already recognised and accepted by the public. Would it not, therefore, be to the greater general interest if those medical men who write condemning osteopathy devoted as much time to investigating the science? It is only in rare and exceptional cases that one finds a doctor at all versed in the subject. Some of those who write to the papers are undoubtedly sincere and show evidence of having to some extent attempted to understand the new science, but it is unfortunate that they have not had experience or the confidence or ability to apply osteopathy in a variety of clinical cases, in order to appreciate its value.

We must not lose sight of the fact that osteopathy is here to stay regardless of whether its theories are or are not accepted by the medical profession; the *results*, which are based upon its theories, *are* accepted and appreciated by a very large percentage of the general public. Heretofore the osteopathic profession has been concentrating its efforts upon applying its theory and has now attained a position in relation to the public health which makes it necessary that the theory and practice of osteopathy be further investigated under scientific direction.

To me it seems entirely unnecessary that osteopaths and medical men should publicly discuss their differences of opinion when it is undoubtedly the aim of both to work only for the benefit of the public health.

I am, Sir, yours faithfully,

HONORARY SECRETARY,
Jan. 11th, 1934. British Osteopathic Association.

*** We agree with the honorary secretary of the British Osteopathic Association that discussion is unnecessary, and with his reply it ceases. He says that "osteopathy as taught by the recognised schools is a complete science, incorporating in its curriculum all those adjuncts to the art of healing which have been proven to be scientific and beneficial in restoring and maintaining health." Medicine sets out to train its students in the principles of the working of the human body and mind in health and ill-health. There is a profound difference.—ED. L.

THE USE OF CAPILLARY TUBES

FOR TRANSPORT OF SPECIMENS FROM CASES OF SUSPECTED VENEREAL DISEASE

To the Editor of THE LANCET

SIR,—It is universally admitted that by far the most certain method of diagnosis in the case of a sore that is suspected of being a syphilitic chancre is to examine the secretion from it microscopically under dark-ground illumination. The method is also very useful in secondary lesions of various kinds. The ideal is to have a microscope suitably fitted for the purpose on the spot, but often this is not practicable, and the question then is the best vehicle for transport of the specimen to the laboratory.

In a work, first published in 1918, that was chiefly designed to show practitioners how to avail themselves of modern methods of diagnosis in cases of suspected venereal disease, I recommended that specimens of secretion for examination by the dark-ground method should be allowed to run into capillary tubes, such as are used for calf lymph. Since then it has been very disappointing to me to see how little use appears to have been made of this method. Instead, when no microscope is immediately available, it is usual to find that no specimen is examined or else that it is spread on a slide and dried before dispatch to the laboratory, a method which is far less likely to result in discovery of *Spirochæta pallida* and one which puts the pathologist to much more trouble than when the specimen is sent in the fluid state. Sometimes I have found that practitioners doubted if *S. pallida* sent through the post in the way recommended would be recognisable on arrival. Such a fear is groundless as I commonly keep such specimens in capillary tubes for weeks together for demonstration of *S. pallida* to students and others, but any doubt on this score should be settled by the result of an interesting experiment recently carried out by A. L. McNabb, G. Matthews, and A. D. McClure, of the department of health, Ontario (Canad. Pub. Health Jour., Sept., 1933, p. 405). In December, 1932, these workers decided to determine whether a dark-ground examination of chancre fluid received by post would be reliable and issued to various clinics distant 150 to 1000 miles away outfits for collection of specimens in capillary tubes. The results showed the method to be quite satisfactory, and the experiment was completed by one of a more drastic nature in which they were good enough to request my collaboration. It is described in the following extract from their article:—

"In April last, six combined dark-field outfits were sent to Colonel L. W. Harrison, St. Thomas's Hospital, London, England. Colonel Harrison arranged to have chancre

serum material placed into each outfit. The dates on which this material was collected were May 1st, 2nd, 5th, 17th, 26th and 29th. The six outfits were posted in London on May 30th, arriving at our laboratory June 8th. Dark-field preparations were made from a capillary tube in each outfit. Typical *Treponemata pallida* were found present in each smear. Organisms still possessed power of motility. When stained, smear preparations which accompanied each outfit contained organisms having the typical morphology of *Treponemata pallida*. Kline tests carried out on two of the chancre serum specimens yielded a positive result. On June 21st the remaining portions of the chancre fluid from three of these specimens were mailed to Colonel Harrison, together with a specimen from an Ontario case received at our laboratory on the above date. A letter from Colonel Harrison dated July 6th records the receipt and the examination of these specimens, all of which he reports as showing motile *Treponemata pallida*. These specimens, as set up for dark-field examination and sealed on the microscopic slides with wax, were returned by Colonel Harrison and were received on July 17th. When examined on July 21st, motile *Treponemata pallida* were again found to be present. The specimens were then returned to Colonel Harrison. A letter received on August 5th states that Treponemata are still present and motile. The intervals between the taking of the specimens and the last examination recorded by Colonel Harrison were as follows: 80 days, 71 days, 68 days and 46 days. Three of these specimens have crossed the ocean four times, being in all approximately 38 days in the mail. Two of the crossings were made in the original capillary tube outfit. The last two crossings were made on glass-slide cover-slip preparations sealed with wax. The fourth specimen has made three crossings, the first in a capillary tube, the second and third on a glass slide sealed with wax as previously described."

Incidentally, the periods mentioned in the above extract appear to be the longest ever recorded during which *S. pallida* has been observed to preserve its motility. After July 28th, when the specimens were received from Canada, motility was noted until August 2nd.

I think that the capillary tube is also a useful vehicle for transport of specimens for culture of gonococci. Before the war I found that, even with the imperfect media then employed, it was possible to cultivate gonococci from secretion which had been in a capillary tube in the ice-chest for 24 hours. Recently Dr. T. E. Osmond has extended the experiment and found that successful cultures are possible after five days in the ice-chest or at room temperature. It is of course well known that after being planted on an artificial medium gonococci require warmth, and this fact, with the difficulty of transporting culture tubes, has no doubt deterred many from making use of the cultural method of diagnosis in gonorrhœa, but the conditions are much more favourable when the gonococci are transported in their native medium.

I am, Sir, yours faithfully,

London, S.W., Jan. 14th, 1934. L. W. HARRISON.

TREATMENT OF ARTHRITIS AND RHEUMATISM WITH GOLD

To the Editor of THE LANCET

SIR,—I have read with much interest the article in THE LANCET of Jan. 13th (p. 73) on this subject by Dr. Gerald Slot and his colleagues. I have been using gold in the treatment of arthritis and ankylosing spondylitis at the Devonshire Royal Hospital, Buxton, for several months. The preparation I am using is Allochrysine, on the lines laid down by Forestier, and I have had some encouraging results but observations must continue over a longer period before a detailed report is published. My object in writing this letter is to inquire whether the sedimentation test was used to test the results of the treatment by Dr. Slot. It is our experience at the Devonshire Royal Hospital that this is the most reliable method by which to gauge the progress of patients suffering from arthritis and the method is widely used for this purpose on the continent. Forestier and also Coste stress its value in this respect and point out that the rate of sedimentation is gradually diminished until it approaches normal under the influence of chrysotherapy. I have noted that the curve flattens out markedly in the first hour, dropping more rapidly in the second in cases which have only been under treatment for a few weeks, whereas in cases under vaccine treatment the change in the sedimentation rate appears to lag behind clinical improvement where that occurs.

There are other clinical details and points of technique in the article which invite discussion and criticism, but these will be better deferred until more experience has been gained.

I am, Sir, yours faithfully,

Buxton, Jan. 13th, 1934. CHARLES W. BUCKLEY.

POTENCY OF VITAMIN PREPARATIONS

To the Editor of THE LANCET

SIR,—I would be grateful for permission to express in your columns our cordial agreement with the general tenor of Prof. Drummond's letter in your last issue. It has always been our endeavour to afford the medical profession the most precise information in the most unambiguous terms possible as to the activity of those of our food and pharmaceutical products for which specific vitamin content is claimed.

At the same time, it must be recognised that there have been, and still are, considerable obstacles in the way of using the provisional international units for the object desired alike by Prof. Drummond and ourselves. The use of carotene in the international standard preparation for measuring vitamin A has until quite recently been fraught with such difficulties as to make accurate comparisons with it almost impossible. Workers in different laboratories have failed conspicuously to agree in their assessment of the number of international units of vitamin A in identical sources. I have reason to believe that this state of affairs is happily being brought to an end; possibly within a few months the use of the international unit for vitamin A may be capable of general adoption.

The use of fresh lemon juice as the "standard preparation" of vitamin C has been seriously handicapped by the natural variations in the vitamin-C content of lemons, even of the same batch. This has been the finding of several workers and has recently been confirmed in our own research laboratory; we hope shortly to publish our observations in detail elsewhere.

Although the isolation of calciferol has, possibly, rendered obsolete the international standard preparation of irradiated ergosterol, this is not true in any sense of the international unit itself. We are entirely at one with Prof. Drummond in insisting that there can to-day be no excuse for using any other unit of vitamin D or for any vagueness in statements as to the number of units present in a given food or medicine. The same is true, mutatis mutandis, of the international B_1 unit.

It is much to be hoped that the conference next summer of the Permanent Commission on Biological Standardisation of the Health Organisation of the League of Nations will still further clarify the position. The introduction of calciferol and ascorbic acid as

the new "standard preparations" of vitamins D and C respectively, the replacement of carotene in the standard preparation by a concentrate of pure, or nearly pure, vitamin A, and the provision of standard preparation and international unit, even if only temporary, for vitamins B_2 and E would bring real benefit to research workers and clinicians alike.

I am, Sir, yours faithfully,

A. L. BACHARACH, M.A., F.I.C.
Chief Chemist, Glaxo Laboratories.

London, N.W., Jan. 12th, 1934.

To the Editor of THE LANCET

SIR,—Prof. Drummond has performed a valuable service in drawing attention to the confusion which exists in the methods of expressing the vitamin content of commercial preparations. It is undeniable that misleading statements are frequently made, and that there is a tendency in some quarters to adopt that system of units which gives the most impressive figures. It is all the more desirable that international units should be universally adopted, since the manufacturer who now uses these units and makes an honest endeavour to state the true vitamin content of his preparations finds himself at a disadvantage.

Nevertheless a complication is introduced by the fact that in respect of vitamins A and C chemical or physical tests are available which are at least as accurate, far more expeditious, and much less costly than biological tests. Vitamin C can be directly determined chemically and the result expressed as a percentage of ascorbic acid. Vitamin A can be determined in fish-liver oils and their preparations by means of the ultra-violet spectrograph or (less accurately) by the antimony trichloride colour test (known as the "blue value"). These values cannot be stated in terms of the accepted international units as there are at the present time no generally recognised factors expressing the relationship between them.

The manufacturer thus has to choose between stating potency in terms of international units, which means carrying out biological tests at great expenditure of time and money, or in terms of physical or chemical values, obtained by tests which are less liable to error, and are completed in as many hours as biological tests occupy weeks. There is little doubt as to which he will prefer. As far as vitamin A is concerned there is therefore some difficulty in adopting a uniform method of expression of potency until results are accumulated showing the relationship between international units and values obtained by other methods.

I am, Sir, yours faithfully,

NORMAN EVERS, B.Sc., F.I.C.

Allen and Hanburys Ltd., Bethnal Green, E.,
Jan. 16th, 1934.

COLOUR-BLINDNESS IN THE NAVY

To the Editor of THE LANCET

SIR,—I much appreciate the remarks which were made in THE LANCET recently (Dec. 16th, 1933, p. 1384) on my little book entitled "Science and Pseudo-Science." Mis-statements are frequently made with regard to vision and colour-vision. Colour-blindness especially of a slight variety is much more common than is supposed. In a paper read before the British Association in 1911 I pointed out that 25 per cent. of men had diminished colour perception and at least 6 per cent. dangerous. In my opinion a properly constructed lantern is infallible. I have never heard of any colour-blind person who could pass my lantern, and those who are passed are ipso facto not dangerous no matter what other tests they may fail in. Ishihara's is not a satisfactory test as many practically normal sighted are rejected by it.

The pseudo-isochromatic tests in common use are those of Stilling and Ishihara and my card test. In order to ascertain the relative merits of these three tests, 50 consecutive referred, or appeal, cases were examined at the Board of Trade, with the following results. It should be noted that none of these cases was examined by me alone; in all of them at least three persons and often more were present at the examinations. In every case Capt. Ellery or Capt. Dowdy and the recorder were present. Each candidate was first examined by the pseudo-isochromatic tests and the fact whether he was dangerously colour-blind or not was ascertained subsequently.

Seventeen of the 50 cases were passed and 33 rejected. Of the 33 who failed, 19 failed with all three pseudo-isochromatic tests, but 14 of those rejected passed Ishihara completely, and 13 passed Stilling. Of those who were passed, 13 showed defects with my card test, and of those who failed all were rejected by my card test, in most cases failing very badly, as for instance, not reading card 8, a yellow-green C on an orange ground. The explanation of the difference is that a test for a dichromic will not necessarily detect a trichromic and those with shortening of the red end of the spectrum; both are obviously dangerous, as shown by the examination with the lantern and spectral tests. In my card test also the pattern is the same on every card, so that the examinee has to judge by colour alone and cannot follow the design of the artist.

An important point to note is that a test which is difficult to the normal sighted is not necessarily difficult to the colour-blind. This is shown by the number of colour-blind persons who can read Stilling's plates, numbers 9 and 10, the reading of which is supposed to indicate very good colour perception. In fact a test may be constructed which can be read by the colour-blind, but not by the normal sighted.

I am, Sir, yours faithfully,

F. EDRIDGE-GREEN.

Board of Trade, S.W., Jan. 13th, 1934.

BRITISH COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS

REGULATIONS FOR THE DIPLOMA

THE College has decided to award a diploma (D.C.O.G.) to registered medical practitioners who have had special post-graduate training and experience in obstetrics and satisfy its examiners. The diploma is designed to assist the public health authorities and committees of voluntary hospitals and other organisations in the selection of practitioners who have made a special study of the subject after qualification.

The determination of the sufficiency of the post-graduate training and experience will, in all cases, rest with the examination committee of the College, and will be based on the evidence required as set out in the regulations which follow. The scope of the examination may be described in short as what is usually understood by the science and practice of obstetrics with, in addition, postnatal care of mother and child and the disabilities arising from childbearing. Gynæcology will be included in the examination only as far as it may be directly associated with childbearing. Experience in, or a knowledge of, major gynæcological operations will not be required.

The examination will be in three parts: (1) A written paper. (2) An oral and practical examination,

including obstetrical operations on the model and obstetric pathology. (3) A clinical examination. The examination will be held twice a year at dates of which due notice will be given: the written part will be held in the College House, 58, Queen Anne-street, London, W. 1, and/or other centres if the number of applicants justifies it; the clinical, practical, and oral examinations at hospitals in London and provincial centres, and/or in Scotland and Ireland. Examinations may also be arranged in the Dominions if so desired.

REGULATIONS

1. Every candidate for the Diploma must have been entered on the Medical Register, or on the register of a British Dominion or Dependency, or of the Irish Free State, for at least three years.

2. Candidates whose names do not appear on the British register must submit evidence of holding degrees or diplomas recognised by the General Medical Council.

3. In addition, every candidate must submit evidence of having held appointments as follows:—

(*a*) *General Medicine and Surgery.*—Six months' resident appointment, after qualification, in the medical or surgical department of a recognised general hospital. For the present, candidates unable to comply with this must produce evidence of having been registered for five years and engaged in the practice of medicine during that period.

(*b*) *Obstetrics.*—Six months' resident appointment, after qualification, in the maternity department of a recognised general hospital, or in a recognised maternity hospital. A satisfactory course of resident post-graduate study in obstetrics may in special circumstances be taken into account.

(*c*) *Gynæcology.*—Attendance on an approved post-graduate course. This may be combined with (*b*) in one appointment.

(*d*) *Antenatal, Postnatal, and Infant Welfare Clinics.*—Six months' regular attendance at these clinics in a recognised general hospital or maternity hospital, or clinics under the local authorities where teaching is conducted and at least two clinics a week are held. These duties may be concurrent with (*b*) and (*c*). For the present, evidence from the medical officer of health or official of a voluntary hospital or other committee of having been in responsible charge of an antenatal clinic for at least 12 months may be accepted.

4. For the present, candidates whose names have been on the Medical Register and who have been engaged in the practice of medicine for at least ten years, may be admitted to the examination on the production of evidence that they have served five years on the staff of a maternity hospital. Attendance on approved post-graduate courses will also be taken into account.

5. A fee of 10 guineas will be payable for the first admission to the examination, and of 7 guineas for re-examination.

PANEL AND CONTRACT PRACTICE

A BREATHING SPACE

THE doctors of Northampton have, through their secretary, who is also the secretary of the local medical and panel committee, given six months' notice from December, 1933, to terminate their contracts with the various friendly societies and clubs in the borough for the treatment of uninsured persons. As it is stated in the covering letters that the doctors would be glad to meet representatives of the societies to discuss the matter, it appears that some alteration is desired in the terms of contract rather than its discontinuance. An official of a society is reported to have said: "Under State Insurance they (the doctors) have been receiving 10*s.* per head, but the figure was reduced not long ago to 8*s.* 3*d.*" It is not true to say that the fee before the reduction was 10*s.*, for at the last arbitration the profession was awarded a capitation rate of 9*s.*, which was reduced by the 10 per cent. cut to about 8*s.* 3*d.* The doctors have, it seems, continued to receive 10*s.* for uninsured members although treating at a rate of 4*s.* old members debarred by incapacity from becoming State-insured. A contract was made in 1922 whereby the doctors received 6*s.* per juvenile member per year. A friendly society is apt to regard insured and uninsured persons from a different standpoint. With an insured person everything is more or less determined by rule; the stamps are the same, the doctor's fee is the same everywhere, the patient's contribution is fixed, the amount allowed to the society for the cost of administration is fixed. But with the non-insured population there is more scope, and it is possible by bargaining to play one doctor off against another. On the other hand, the really healthy person rarely makes a voluntary medical contract. They use the "I am never ill" argument against it. But the weakly members are ready to contract, and the medical risk is therefore much larger for the non-insured population. Moreover the medicine supplied to insured persons costs the State something like 3*s.* a head a year, when the bulk of them are healthy people. If then professional attendance and medicine in 1932 cost just over 11*s.* 6*d.* per head for every insured person (healthy and unhealthy), it is manifestly absurd to suggest that 10*s.* per head is enough to cover medical care and supply of drugs for these outsiders who carry a much higher risk of ill-health. Again, the persons at both ends of the age scale are much enhanced risks. Probably the best plan would be for the Northampton doctors to allow these uninsured persons—old stagers, adults, and children—to join en bloc a scheme like the public medical service at agreed rates for the different classes, the members to have free choice of any doctor working in the service. It should be possible to arrange some scheme of compensation for the doctor hitherto holding the club appointment, (say) two years' purchase of his loss in the particular club, to compensate him for his gesture of professional loyalty. The club secretaries would then pay their contribution direct to the medical service. Although such a scheme would cost more money it would be worth the extra cost.

DONCASTER ROYAL INFIRMARY.—Steps are being taken to provide a new out-patients' department at a cost of £25,000, towards which the Miners' Welfare Fund has allocated £9500. At the recent annual meeting of the governors, the mayor of Doncaster, Councillor G. H. Ranyard, described the conditions as deplorable. They are thus detailed by the *Yorkshire Evening News*: "The out-patients' department is an old decrepit building, badly ventilated and draughty, and entirely unsuited to its present use. Patients have to be herded together in ill-lit and insufficiently heated waiting-rooms, and their treatment is carried out under trying conditions. Over 80,000 attendances were made at the out-patients' department last year. In the casualty room there is only one bed. If two or three people are injured in the same accident and brought to the out-patients' department there is only bed accommodation for one. Any others who are seriously injured have to be laid on the floor. There are no cubicles in recovery rooms, and the staff has to work under harassing conditions."

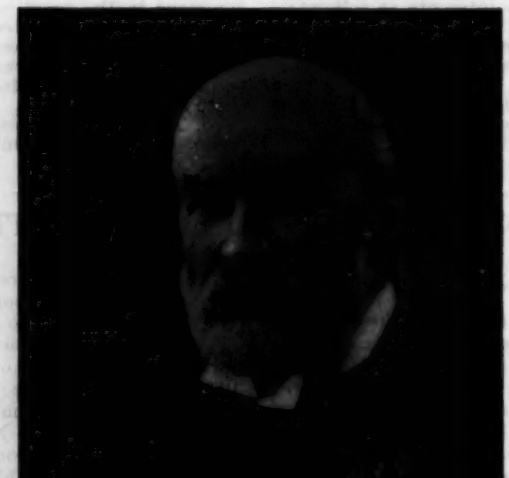
OBITUARY

Sir DONALD MACALISTER, Bart., K.C.B., M.D.

LATE PRESIDENT OF THE GENERAL MEDICAL COUNCIL

WE regret to record the death, on Monday last, of Sir Donald MacAlister, Chancellor of the University of Glasgow, and for 44 years a member of the General Medical Council, over which he presided from 1904 until 1931.

Donald MacAlister, the eldest of a family of eight, was born in Perth on May 17th, 1854. His father, also Donald, came from the home of the MacAlisters, Tarbet, Cantire, and was on the staff of Messrs. Blackie and Sons, publishers, Glasgow. His promotion to more important agencies is the reason why so many places claim a share in the son's education. From Perth the family moved to Aberdeen, where the boy attended a well-known private school, and from there to Liverpool, whose Institute claims him among its most distinguished pupils. Having to make his own way in the world, he entered for scholarship examinations at Oxford and at Cambridge almost simultaneously, and in a way not now possible. A series of successes compelled him to make a choice between Balliol or Worcester, at Oxford, and St. John's, Cambridge, and the choice fell on the last. A brilliant career as a student culminated in 1877 with graduation as senior wrangler and first Smith's prizeman. He seemed to be marked out for a mathematical career, and had serious thought of applying for the chair of mathematics in the University of Glasgow, while he actually joined the teaching staff at Harrow as a mathematical master. He held this post for only a year, however, and in 1879 entered St. Bartholomew's Hospital, for, unusual as was his approach to medicine, he always meant to be a doctor. The curriculum was shorter then, and being already B.Sc. Lond. he graduated as M.B. in 1881. While doing his clinical work and as a student there he held the post of lecturer on natural philosophy in his medical school, and proved himself a valuable member of the teaching staff, making physics, always a baffling subject to beginners, remarkably clear. After an interval of post-graduate work in Leipzig he returned to Cambridge, where he decided to go into practice. At this period he published a translation of Ziegler's Pathological Anatomy which went through three editions and became a standard text-book in the early 'eighties. He was soon elected to the staff of Addenbrooke's Hospital, while at St. John's College, where he was a fellow and Linacre lecturer, he became senior tutor. He practised as a consulting physician in Cambridge and the surrounding country for a time, but made no serious attempt at success in this direction, devoting himself almost from the first to questions of medical education and organisation. He soon became the right-hand man in the conduct of the Cambridge medical faculty to Sir George Paget, then regius professor of physic, and in 1889 succeeded Sir George Humphry as representative of the University on the General Medical Council.



SIR DONALD MACALISTER

Photograph by Bassano

Meanwhile he gained a position as physician by association with the Royal College of Physicians of London. He took the M.R.C.P. in 1881, and was five years later elected F.R.C.P. In 1886 he was appointed Croonian lecturer at the College, and delivered a series of useful discourses upon antipyretics. The close study of these drugs was at the time becoming a matter of practical importance, and MacAlister, whose vast reading in continental languages, especially German, gave him access to all prominent literature on the subject, did not limit his discourse to considering the particular drugs or their pharmacology; he discussed them rather in the light thrown on the nature of fever by the results of their employment in successful and unsuccessful treatment. In 1887 he delivered the Goulstonian lectures on the nature of fever, in which he displayed his mastery of physics in his notes on colorimetry, while his erudition and critical faculty gave point to his accounts of the physiological experiments of the German school. He refused to say anything of the therapeutics of fever on the grounds that "there is probably no Fellow of the College here present who could not teach me many lessons," and in similar vein he ruled out discussion of ætiology and bacteriological research. The lectures formed a logical sequence to the Croonian deliveries.

MacAlister's introduction to public affairs came in 1889, when at the age of 35, having been eight years only on the Medical Register, he stood successfully for the representation of his university on the General Medical Council. It was to his zeal for university reform that he owed his election. What he did for the Council it would require a volume to tell—or rather it has been told in volume bulk in these columns through a series of annual reports of the sessions. During 44 years of membership, of which 27 were in the President's chair, he laboured unceasingly to make the Council an efficient agency for carrying out the duties laid on it by the Medical Acts, and under his guidance the sessions became more and more businesslike, while, though he claimed no credit as a financier, the financial stability became assured.

We are indebted for the following personal view of MacAlister's work on the Council to Colonel Norman King, the recently retired Registrar. "My recollections," he writes, "of Sir Donald MacAlister date from 1897 when I joined the service of the Council.

Sir Richard Quain was President, but was confined to bed in his last illness, and Sir William Turner was acting in his place, being succeeded as chairman of the business committee by Dr. MacAlister, as he then was. In order that business might be got through more expeditiously a revision of the standing orders relating to procedure was undertaken by MacAlister, who drew up new orders which were adopted almost without change, and remain to this day as they were. He became responsible for the wording of the well-known warning notice relating to the employment of unqualified assistants, through which no one has ever been able to drive the proverbial coach and horses; it has covered every point which has ever arisen. During this time also he settled the exact form which the minutes should take, and this has always been carefully followed. His eye for misprints was that of a hawk, and he always read through the annual volume of minutes, inserting all necessary corrections, even down to commas. The same extraordinary qualities of industry and orderliness enabled him to become virtually responsible for the editions in 1898 and 1914 of the British Pharmacopœia. When he was elected President to succeed Sir William Turner in 1904, after only 15 years' service, he had already shown his extraordinary ability and aptitude for the post, and this became more evident as time went on. Especially was he a great saver of time. Instead of allowing difficult matters to be discussed in committee of the whole Council and then brought up on report (a lengthy proceeding), he insisted that all matters should be thrashed out by the appropriate committee and reported upon. In consequence the sessions, instead of lasting as previously almost always for six or seven days, were reduced to four or five days, with resulting economy in the time of busy members and in the finances of the Council. He was unsurpassed as the chairman of meetings. In the first place he was always absolutely master of his subject, and, if necessary, could give at the beginning a lucid explanation of the matter for consideration, thus saving much discussion arising out of misunderstanding. It was said of him that not only did he know of what people were thinking, but also knew of what they were going to think, and indeed he had an almost uncanny sense of how to conduct the proceedings. Sometimes he would give an explanation of the point at issue which enabled a decision to be reached with but little discussion, and sometimes he would allow debate until he knew the views of the majority. At this point he would take up his pencil, and, whilst listening to the proceedings and keeping them in order, would draft a resolution and ask 'if that was the sort of thing which would meet the point.' Almost always it would be found that he had suggested a solution of the problem which met the views of the meeting. It came to be recognised that generally his view was correct; he acquired an unusual ascendancy at all meetings, and almost unconsciously he took a leading and helpful part on all occasions.

"I was associated with him from 1897 to 1932, and for 20 of these years I was closely in touch with him as Registrar. It would be almost impossible to find a chief under whom it would be more pleasurable to serve. Although his mind was on so high a plane he never made inferiority felt. He wrote everything with his own hand, and with a view to save him labour it was my custom to submit to him drafts of reports, memoranda and letters. A lesser man would have corrected freely, but he, by exchanging a word here and altering a phrase there, gave some of his own impress to the manuscript, never conveying the impression that it was useless to try to prepare matter for him. He was never too busy to give attention. His memory was so remarkable that he kept no copies of his letters, but could always recollect what he said. In spite of the many matters which were constantly under his attention, two or three words would instantly recall to his mind in full detail any subject on which it was desired to consult him. He once said that his mind was like a card-index, and this was in fact the case. It was not only an education but a privilege and a pleasure to serve under him, and it is with deep gratitude that I recall that my lot was cast in such a pleasant place for so many years. He inspired an affection in those who served with and under him that few are able to do, and he leaves behind him a heavy sense of personal loss."

In 1907 MacAlister was appointed principal and vice-chancellor of the University of Glasgow, where he displayed the great qualities which had already won him his ascendancy at the General Medical Council. The University expanded under him, and many projects already planned found under his influence material existence; buildings were added, academic endowments were secured, and faculties came into existence or were reorganised. Throughout the war, and during the years that immediately followed, the task of the principal was a very heavy one, but in face of all difficulties, and also in spite of several severe illnesses, MacAlister presided over the University of Glasgow in a way that inspired universal admiration, so that it was fitting, when in 1929 he resigned the principalship, that he should have been elected chancellor, the post having just fallen vacant by the death of Lord Rosebery.

MacAlister's successful career is a record of untiring work. As the eldest child of a widowed mother, he succeeded while young to the responsibilities of care for her and for the education of the younger members of the family. At his schools and University he never allowed his brilliant and subtle intellect to persuade him to take things easily, he was always working to get to the bottom of things. No better example of this quality can be furnished than by his remarkable gift of tongues. He acquired a literary acquaintance with more than a dozen languages. Many of these he could speak, while he proved his complete linguistic mastery of some by the reissue about ten years ago of a volume entitled "Echos." The book showed their author to be able to translate Spanish, Italian, and Russian into English; Greek and German into Russian; and Provençal into Scots, while passages from Oliver Wendell Holmes and Robert Louis Stevenson appeared in German form, and quatrains from Omar Khayyám, ballads by Walter Scott, and parodies by Calverley were rendered in Romani.

Mention must be made of MacAlister's deep love of Scotland. Though, after leaving Glasgow, he elected to return to Cambridge, and though he lived for the greater part of his life in England, his heart was rooted in the Highlands, and he was happiest when spending his vacation on the shores of Loch Fyne, surrounded like a Highland chief by members of his clan. He used to say that the acquisition of any language was easy when one began with Gaelic. He married, in 1895, his cousin, Edith, daughter of Alexander MacAlister, professor of anatomy in Cambridge, and to her, a real helpmate, the public is indebted more than it knows for the work which Sir Donald, in spite of frail health, was able to do in the last 20 years of his life.

Honours descended on him in an accumulating stream. He was created K.C.B. in 1908 and a baronet in 1924, Commander of the Legion of Honour and

Cavalier of the Crown of Italy in 1919; ten Universities gave him their LL.D., and others their D.C.L., D.Sc., and D.Phil.; and he was a Fellow of every College of Physicians in Great Britain and Ireland.

WILLIAM JOSEPH MAGUIRE, M.D.R.U.I., F.R.C.P. Irel.

Dr. Maguire, who died in Dublin on Jan. 8th, was formerly medical member of the National Health Insurance Commission for Ireland. Born in County Down, about 68 years ago, he received his medical education at Queen's College, Belfast, and qualified in 1894. For many years he practised as a physician in Belfast, and was on the staff of the Mater Infirmorum Hospital. When the National Health Insurance Act was passed in 1911 and a commission was established for Ireland in 1912, Maguire was appointed as medical member—a post which he held until his retirement two years ago. In this capacity he won general respect by his painstaking investigations and his manifest fairness. As an official he was straightforward, sympathetic, and progressive. He never regarded a system for providing cash benefits for sickness as an adequate system of health insurance, and his influence was always exercised in favour of development which would provide for treatment as well.

Dr. Maguire is survived by his wife. One of his family is a member of the medical profession.

Dr. WM. ACKRILL STAMFORD, of Tibshelf, in Derbyshire, whose death is announced at the age of 93, qualified as M.R.C.S. in 1863. He was in practice at Tibshelf for over half a century and in his younger days was well known as an athlete. Later he was a regular rider to hounds, and in 1881 he won the first point-to-point race promoted by the Grove Hunt. An ambulance brigade which he founded at Tibshelf earned such fame that it appeared by command before Queen Victoria. In 1900 King Edward, then Prince of Wales, presented Dr. Stamford with a long service medal.

PUBLIC HEALTH

A MILK RATION ALL ROUND

IN Fabian Tract, No. 240 (Fabian Society, December, 1933, 3*d.*), Mrs. Barbara Drake sets out a new plan for the State feeding of school-children, starting from the assumption that while we are well supplied with variety and abundance of foodstuffs children are living on diets which do not provide the minimum conditions of health and growth. She covers the facts about malnutrition in a survey both objective and telling; after weighing the evidence of school medical officers she expresses a doubt whether all the children suffering in one degree or another from malnutrition are discovered by the school doctor, and she quotes with approval words from a leading article in the *Medical Officer*: "It takes a lot of ill-feeding to kill a child; it takes very little to sap his value seriously." She does not put them, as she might, alongside some words from the last annual report of the chief medical officer of the Ministry of Health: "There may be impairments in man's body, or underminings and premonitions of them, which present no external evidence, even as there are conditions of health, mentality and potential energy which are not readily assessable. Hence, if and when we find, at any given moment, an absence of evidence of physical impairment or increasing mortality it does not and cannot mean that all is as it should be."

Mrs. Drake then passes to consider the provision of school meals in the Act of 1906. The great weakness of this Act she finds in its permissive character. Authorities are not obliged to operate it and in order to do so they must first of all declare that there are necessitous children in the area and that voluntary funds are not forthcoming to feed them. Where the provision of school meals has not kept pace with the need it may be due to lack of initiative or of sense of responsibility or the authority may be too poor to incur the expense, but the result on the child is the same. Some authorities leave the selection of the children to the school doctor, others make their selection primarily on an income basis, or it may be left to the care committee to decide each case on its merits. But the underfed child does not always come at once to the notice of the school doctor and the early signs of malnutrition are by no means easy to detect. The truth is in fact that on any basis the selection of the under-nourished child is an extremely difficult business, and when growth has already been impaired there is a limit to what can afterwards be done to repair the damage. Quite apart from physical standards, supplementary milk meals, according to the evidence of school medical officers, result in more regular attendance, more alert and receptive children. Mrs. Drake then goes on to deal with the economy of "community" feeding. She associates the growing use in working-class homes of tinned and semi-cooked foods with the lack of proper cooking conveniences and the high cost of fuel, and finds therein confirmation of the urgent need of children to drink more milk. The present need of the farmer too is an outlet for fresh milk; politicians of all colours have in fact placed milk meals for school-children in the forefront of measures which would restore prosperity to this country. Moreover, a school-child receiving his dinner at school as well as a milk meal would be assured of the full supply of first-class protein of which so much is heard at the moment.

Mrs. Drake proposes that the Exchequer grant at present prevailing for school meals should be raised from 50 to 80 per cent. and that the dietaries should be directly supervised by the Board of Education's medical staff. She estimates that this would cost 21 million pounds a year—or (say) 4½*d.* on the income-tax—and is not shocked at the thought. It does not appear, she remarks, that there is any particular virtue in *not* spending. The economists teach that the purpose of money is to spend it; that is, they say, what money is for; and Mrs. Drake asks those who oppose school feeding on the ground of expense to explain "how money could be better or more productively spent than on the slow unfolding in growth of the best potential qualities, physical and mental, inherent in the child at birth." This year's prospect of a budgetary surplus would have encouraged her.

COMPENSATION FOR TREATMENT OF FEVERS AT HOME

If an epidemic of infectious disease fills the local hospitals ought those patients to be compensated who, for want of hospital accommodation, have to be treated at home? This question was raised at a

recent meeting of the Stirlingshire public health committee. The medical officer, Dr. T. Adam, was able to report that the peak of the epidemic was passed some two months ago and that it was now possible to take into hospital all cases notified. The figures showed that 71 out of 243 scarlet fever patients had been treated at home. Treatment in hospital, argued some of the speakers, means treatment with a minimum of cost and inconvenience to the patient's household; treatment at home means some additional expense in doctors' fees and perhaps positive loss as well as inconvenience where children must be kept from contact with others. If ratepayers pay for the upkeep of the hospital, have they not the right to hospital treatment? If so, should they not be compensated if it is not available? The question seems to have been raised on economic rather than on legal grounds. In some districts in England, where a local Act has so provided, the local authority may compensate anyone for loss suffered when he ceases his employment at its request and at the instance of the medical officer in the course of measures taken to prevent the spread of infectious disease. Under the general law contained in the Public Health Acts, compensation is payable for unnecessary damage done to a house in the process of its disinfection by the local authority. The existence of these express provisions seems to confirm the view that special statutory sanction would be required before the claims advanced in Stirlingshire could be met. Dr. Adam reminded the meeting that isolation is not entirely for the benefit of the patient but also for the benefit of the community. The local authority has to provide adequate hospital accommodation and it is left to the department of health to decide the standard. The local authority, he said, is not obliged to isolate cases except in certain named circumstances, one of which is that the infectious patient is without proper lodging or accommodation. In Stirlingshire they had isolated many cases where proper lodging and accommodation could have been found. He added an interesting comment upon the change in the public outlook. When he first came to Stirling in the days before the war, a large proportion of the citizens objected to their children being taken away to hospital. Now they rather asserted their right to hospital treatment. He himself was glad of the change of sentiment; it testified to the public confidence in the excellent service rendered by the hospitals. The same change in outlook is rather strikingly evident in London just now, where some of the daily press is taking the county council to task for not removing to hospital all the mild cases of scarlet fever. There is of course not enough space for them as well as all the potentially severe cases of measles and whooping-cough.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 6TH, 1934

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 3 (last week 2); scarlet fever, 3464; diphtheria, 1226; enteric fever, 14; acute pneumonia (primary or influenzal), 1963; puerperal fever, 52; puerperal pyrexia, 143; cerebro-spinal fever, 31; acute poliomyelitis, 5; acute polio-encephalitis, 1; encephalitis lethargica, 9; continued fever, 1 (Leigh M.B., Lancs); dysentery, 14; ophthalmia neonatorum, 60. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 9th–10th was as follows: Small-pox, 14 under treatment (last week 14); scarlet fever 2762; diphtheria, 2106; enteric fever, 11; measles, 882, whooping-cough, 236; puerperal fever, 19 mothers (plus 11 babies); encephalitis lethargica, 257; poliomyelitis, 5; "other diseases," 282. At St. Margaret's Hospital there were 18 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 118 great towns, including London, there was no death from small-pox, 4 (1) from enteric fever, 43 (12) from measles, 8 (0) from scarlet fever, 29 (6) from whooping-cough, 65 (16) from diphtheria, 38 (8) from diarrhœa and enteritis under two years, and 109 (20) from influenza. The figures in parentheses are those for London itself.

The deaths from influenza during the past few weeks (working backwards) have been as follows: 109, 83, 97, 95, 70, 59; the 109 deaths during the first week of the year compare with 678 for the corresponding week of 1933. Nine deaths were attributed to influenza at Birmingham, 4 each at Bolton, Manchester, Sheffield, Nottingham, and Norwich. Manchester, Sunderland, and Coventry each reported 1 death from enteric fever. Six fatal cases of measles occurred at Manchester, 3 at Leeds, Liverpool, and Stockton-on-Tees. Manchester reported 4 deaths from whooping-cough. Of the fatal cases of diphtheria 6 were reported from Hull, 4 from Huddersfield, 3 from East Ham.

The number of stillbirths notified during the week was 282 (corresponding to a rate of 43 per 1000 total births), including 52 in London.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Lt. (D) W. Holgate to be Surg. Lt.-Comdr. (D).

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lts. C. C. Ungley and A. H. Shellswell to be Surg. Lt.-Comdrs.

ROYAL ARMY MEDICAL CORPS

Lt. C. S. Gross to be Capt. (Provl.).

ARMY DENTAL CORPS

Capt. R. A. Roth retires, receiving a gratuity.
K. H. Coulton to be Lt. (on prob.).

TERRITORIAL ARMY

Lt. H. R. Vernon is secd. under para. 135, T.A. Regs.

TERRITORIAL ARMY RESERVE OF OFFICERS

Capt. W. G. McKenzie relinquishes his commn. and retains his rank.

INDIAN MEDICAL SERVICE

The prob. appts. of the undermentioned officers are confirmed: J. W. Bowden, R. D. MacRae, and W. Mackie.
Capt. S. K. Menon relinquishes his temp. commn.

DEATHS IN THE SERVICES

The death is announced of Surg. Comdr. Edward Henry Macsherry, M.D., M.Ch. R.U.I., R.N. (retd.), at 2, Eyns-road, Eastbourne, on Jan. 4th.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—Prof. W. W. Jameson, dean of this school, who is visiting Ceylon and India with representatives of the Rockefeller Foundation, arrived in Colombo on Jan. 9th. In view of the amalgamation of the Ross Institute with the London School of Hygiene and Tropical Medicine, Prof. Jameson will, before returning home in April, visit some of the Ross Institute research centres in Assam, and Bengal, and afterwards proceed to Malaya. During his absence Prof. R. T. Leiper, F.R.S., has been appointed acting dean. Prof. J. Gordon Thomson, director of the department of protozoology, is leaving London on Jan. 31st, and will travel by air to South Africa. Thence he will proceed to East Africa, where he will spend six months in research on malaria and sleeping sickness, with special reference to immunity.

MEDICAL NEWS

University of Oxford

Mr. W. E. Le Gros Clark, professor of anatomy at St. Thomas's Hospital, has been elected Dr. Lee's professor of anatomy, in succession to Prof. Arthur Thomson, who is retiring in October.

Prof. Le Gros Clark, who qualified in 1917, received his medical education at St. Thomas's Hospital where, after resident appointments, he was appointed demonstrator in anatomy. He became F.R.C.S. Eng. in 1920, and spent the next three years in Sarawak as principal medical officer. In 1924 he was appointed reader in anatomy in the University of London, and from 1927 to 1929 held the university chair at St. Bartholomew's Hospital.

University of Glasgow

Harry Stewart Hutchison Prize.—An award of this prize, which has a value of £50, will be made in 1935. Competitors should submit, not later than March, 1935, a piece of writing embodying original research work in a branch of science relating to children. Further particulars will be found in our advertisement columns.

University of Durham

Two special courses for post-graduates have been arranged to take place before Easter. On Thursdays at 4 P.M. (beginning on Jan. 25th) Dr. J. C. Spence will lecture on diseases of children. The first lecture will be at the Royal Victoria Infirmary. A series of ten meetings dealing with tuberculosis and infectious diseases will be held on Wednesdays at 3.30 P.M. (beginning on Jan. 24th). These lectures will be given at the City Hospital. On Sundays at 10.30 A.M., from Jan. 21st to March 25th, classes for clinical instruction or lecture-demonstrations will be given. Particulars may be had from the registrar of the College of Medicine, Newcastle-upon-Tyne, 1.

Royal College of Surgeons of England

A quarterly meeting of the council was held on Jan. 11th, with Sir Holburt Waring, the president, in the chair. Dr. John Beattie was admitted to office as conservator of the museum and director of research. The Hallett prize for anatomy and physiology was awarded to Ananda Nimalasuria, of Ceylon Medical College, and King's College, London. A diploma of fellowship was granted to T. T. Stamm, of Guy's Hospital.

Diplomas were granted, jointly with the Royal College of Physicians, as follows :—

Tropical Medicine and Hygiene.—G. H. Cooray, P. W. Godfrey, G. M. Raby, B. H. Rassam, and R. du T. van der Merwe.

Psychological Medicine.—J. S. Allen, C. C. Beresford, P. M. Crowe, Cicely L. Hingston, J. H. R. Laptain, J. K. Marshall, T. C. St.C. Morton, W. C. M. Scott, J. A. Shaby, and E. T. O. Slater.

Laryngology and Otology.—W. G. Bridgman, I. C. Fraser, Kuryan George, T. P. Gill, A. C. Goodwin, Mendel Gordon, H. G. Grieve, A. D. Minhas, P. L. O'Neill, I. M. Rutherford, I. B. Senjit, and R. H. Smith.

Medical Radiology.—J. B. Douglas, R. S. Harrison, and J. E. Wilson Lee.

Edith Cavell Home of Rest for Nurses

The annual report for the year ended on June 30th last shows that £1026 was raised by donations and collections, £723 was contributed by guests, and investments produced £1329. There are three homes, at West Norwood, Haslemere, and Windermere. The last-named is free, but at the others £1 a week is charged. At Haslemere there were 151, at West Norwood 132, and at Windermere 150 visitors, who stayed from 17 to 19 days. More annual contributions are needed.

Medical Society of Individual Psychology

The annual dinner of this society was held at the Florence Restaurant, London, on Jan. 11th. Dr. J. C. Young, who presided, gave a gratifying account of the society's progress, and said that there were now 117 members and associates. Prof. W. Langdon Brown proposed the toast of the guests and replies were made by Mr. McAdam Eccles and by Dr. Emanuel Miller, who spoke of the value of the methods of individual psychology to the practitioner. Dr. A. Baldie, in proposing the toast of the chairman, stated that he and others in general practice were finding their usefulness much increased by the knowledge of these methods.

The Price of Insulin

Messrs. Burroughs Wellcome and Co. announce a reduction as follows in the price of "Wellcome" Insulin :—

1*s.* 10*d.*	for	100 units (5 c.cm.)	reduced from	2*s.*	
3*s.* 6*d.*	,,	200 ,, (5 or 10 c.cm.)	,,	,,	4*s.*
6*s.* 9*d.*	,,	400 ,, (5 c.cm.)	,,	,,	8*s.*

The Sun and the Teeth

On Friday, Jan. 26th, at 8.45 P.M., Sir Frank Colyer will take the chair at a lantern lecture on the Influence of the Sun upon the Teeth—Ancient and Modern, by Mrs. Lilian Lindsay, L.D.S., at the Princess Elizabeth of York Hospital for Children, Shadwell, E.1. Visitors are invited.

Society of Medical Officers of Health

The maternity and child welfare group will meet at the house of this society (1, Upper Montague-street, London, W.C.) at 8.30 P.M. on Friday, Jan. 26th, when there will be a discussion on Diet for the Pre-school Child, to be opened by Prof. V. H. Mottram. A meeting of the fever hospital medical service group will be held at 4.30 P.M. on the same day. Dr. William Mair will read a paper on Varieties of *Corynebacterium diphtheriæ*. The dental officers' group will meet on Friday, Feb. 2nd, at 7.45 P.M.

Changes at the Ministry of Health.

The retirement of Dame Janet Campbell from the public service was announced in our last issue, and on p. 142 will be found a reference to the approaching retirement of Sir George Buchanan. Under arrangements consequent on these departures, Dr. Jane Turnbull will be in charge of the maternity and child welfare division of the medical staff of the Ministry, and Dr. J. M. Hamill will act as senior medical officer in charge of the food division.

A Prize Essay

The editorial board of the *British Journal of Anæsthesia* are offering a prize of £15 for the best essay on any subject directly concerned with the physiology of anæsthesia or the practice of anæsthetics. The competition is open to any person holding a qualification within the British Empire. Essays must be not less than 2000 and not more than 6000 words in length and written or typed on one side of the paper only. They must be submitted on or before August 31st, 1934, to the Editor, at 29, St. Andrew's-mansions, Dorset-street, W.1. The editorial board will be sole judges of the competition and reserve the right to publish in the *Journal* any or all of the essays submitted.

Memorial to Dr. Eichholz

As a memorial to the late Dr. Alfred Eichholz, chief medical inspector of the Board of Education, his cousin, Mr. William Eichholz, has offered to pay the whole initial cost of equipping a new massage clinic in London. The offer was made to, and has been accepted by, the National Institute for the Blind, and the clinic will be established near the headquarters of the Institute in Great Portland-street, London, where it will serve as the headquarters of the profession of massage and electrotherapy by the blind. Dr. Eichholz was a member of the council of the institute and served as chairman of its education and research committee.

Hampstead General and North-West London Hospital

The fourth winter session of post-graduate lectures at this hospital will be opened on Jan. 24th, when Mr. Sidney Boyd will speak on the mimicry of acute appendicitis. Other lectures that have been arranged are : Mr. Arnold Sorsby, on heredity in disease (Feb. 7th); Dr. F. E. Saxby Willis, on the effect of pleural effusions on the course of pulmonary disease (Feb. 14th); Mr. H. Lawson Whale, on modern indication for mastoid operations (Feb. 21st); Dr. Rickword Lane, on the interpretation of blood counts and other blood examinations (Feb. 28th); Mr. D. H. Patey, on some points in the treatment of hernia (March 7th); Dr. Thomas Marlin, on manipulative treatment (March 14th); and Dr. H. C. Semon, on eczematoid ringworm (March 21st). All the lectures will be given at 4 P.M.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Jan. 22nd.—8 P.M., ODONTOLOGY. Mr. M. A. Rushton: A Case of Anidrotic Ectodermal Dysplasia Showing Extensive Dental Defect. Mr. George Northcroft: Estimating the Ages of the Princes in The Tower. Dr. H. H. Stones: The Reaction and Regeneration of Cementum in Various Pathological conditions.

TUESDAY.—5 P.M., MEDICINE: The Present Position of Collapse Therapy in Lung Disease. Discussion to be opened by Prof. Rist (Paris), followed by Dr. L. S. T. Burrell, Dr. R. C. Wingfield, and Dr. Vere Pearson. Members of the Section of Therapeutics are specially invited to attend.

WEDNESDAY.—5 P.M., COMPARATIVE MEDICINE: Chronic Nephritis. Discussion to be opened by Dr. Dorothy S. Russell, Prof. J. Duguid, and Dr. T. Hare.

THURSDAY.—8.30 P.M., UROLOGY: The Factors which Influence Renal Function and the Various Methods of Investigation. Discussion to be opened by Dr. T. Izod Bennett, Mr. Duncan Morison, and Dr. Cuthbert Dukes.

FRIDAY.—8 P.M., EPIDEMIOLOGY AND STATE MEDICINE AND DISEASE IN CHILDREN: The Ætiology of Acute Rheumatism and Chorea in Relation to Social and Environmental Factors. Discussion to be opened by Dr. J. Allison Glover and Dr. W. S. C. Copeman (Epidemiology); and Dr. Reginald Miller and Dr. E. C. Warner (Disease in Children). Dr. R. J. Llewellyn, Dr. C. Bruce Perry, and Dr. J. A. Nixon will also speak.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.1.

MONDAY, Jan. 22nd.—8.30 P.M., Discussion on Value of Pre-operative Investigations. To be introduced by Dr. F. J. Poynton and Mr. Norman C. Lake.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Upper Montague-street, Russell-square, W.C.

FRIDAY, Jan. 26th.—4.30 P.M., FEVER HOSPITAL MEDICAL SERVICE GROUP. Dr. W. Mair: Varieties of *Corynebacterium diphtheriæ*. 8.30 P.M., MATERNITY AND CHILD WELFARE GROUP. Prof. V. H. Mottram: Diet for the Pre-school Child.

MEDICO-LEGAL SOCIETY.

THURSDAY, Jan. 25th.—8.30 P.M. (at 11, Chandos-street, Cavendish-square, W.1), Dr. Louis F. Beccles: The Medico-Legal Aspects of Venereal Disease. To be followed by a Discussion.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.

WEDNESDAY, Jan. 24th.—4.15 P.M. (at 49, Leicester-square, W.C.), Clinical Cases.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEON OF ENGLAND, Lincoln's Inn-fields, W.C.

MONDAY, Jan. 22nd and following WEDNESDAY.—5 P.M., Mr. H. C. Edwards: Diverticula of the Duodenum, Colon, and Appendix. (Hunterian lectures.)

FRIDAY.—5 P.M., Mr. Alan Brews: Radium Treatment of Carcinoma of the Cervix. (Hunterian lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Jan. 22nd to SATURDAY, Jan. 27th.—NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W. Special Post-graduate Course in Cardiology. All day (open to non-Members).—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W. Lecture-Demonstration on Nervous Dyspepsia. By Dr. A. E. Clark-Kennedy, on Tuesday at 2.30 P.M. to 4 P.M.—PANEL OF TEACHERS. Individual Clinics in various branches of Medicine and Surgery are available daily by arrangement with the Fellowship of Medicine.—Courses of Instruction, Lectures, &c., arranged by the Fellowship of Medicine are open only to Members and Associates unless otherwise stated.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, Jan. 22nd.—10 A.M., Medical Wards, Skin Clinic. 11 A.M., Surgical Wards. 2 P.M., Surgical and Gynæcological Wards, Medical, Surgical, Eye, and Gynæcological Clinics, Operations. 4.15 P.M., Lecture, Mr. Curnock: Diseases of Teeth and Gums.

TUESDAY.—10 A.M., Medical Wards. 11 A.M., Surgical Wards. 2 P.M., Medical, Surgical, and Throat Clinics, Operations. 4.15 P.M., Lecture, Mr. Green-Armytage: The Anæmias of Pregnancy.

WEDNESDAY.—10 A.M., Medical Wards, Children's Clinic, Children's Wards. 2 P.M., Medical, Surgical, and Eye Clinics, Gynæcological Operations.

THURSDAY.—10 A.M., Neurological Clinic. 11 A.M., Fracture Clinic. 2 P.M., Medical, Surgical, Eye, and Genito-Urinary Clinics, Operations. 4.15 P.M., Lecture, Mr. Tyrrell Gray: Visceroptosis.

FRIDAY.—10 A.M., Skin Clinic. 12 noon, Lecture on Treatment. 2 P.M., Medical, Surgical, and Throat Clinics, Operations. 4.15 P.M., Lecture, Dr. Owen: The Newborn Infant.

SATURDAY.—10 A.M., Medical and Surgical Wards, Children's and Surgical Clinics.

The Lectures at 4.15 P.M. are open to all Medical Practitioners without fee.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.

WEDNESDAY, Jan 24th.—4 P.M., Mr. S. Boyd: The Mimicry of Acute Appendicitis.

HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.9.

THURSDAY, Jan. 25th.—3 P.M., Dr. Anthony Feiling: Clinical Demonstration.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Jan. 26th.—4 P.M., Mr. N. Asherson: Diseases of the Œsophagus.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Jan. 23rd.—5 P.M., Dr. S. E. Dore: Affections of the Hair and Hair Follicles.

THURSDAY.—5 P.M., Dr. M. Sydney Thomson: Lichen Planus.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.

WEDNESDAY, Jan. 24th.—5 P.M., Prof. Julian Huxley: Embryology as an Experimental Science (Huxley Lecture).

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL.

THURSDAY, Jan. 25th.—4.30 P.M., Dr. R. A. O'Brien: Control and Prevention of Infectious Diseases. 9 P.M., Dr. R. D. Lawrence: Heredity and Human Disease.

ROYAL NORTHERN HOSPITAL, Holloway-road N.

TUESDAY, Jan. 23rd.—3.15 P.M., Mr. McNeill Love: The Surgery of the Organs of Internal Secretion.

LEEDS GENERAL INFIRMARY.

TUESDAY, Jan. 23rd.—4 P.M., Dr. Scargill: X Ray.

GLASGOW POST-GRADUATE LECTURES.

TUESDAY, Jan. 23rd.—3.30 P.M. (in the Faculty Hall, Vincent-street), Dr. D. P. Cuthbertson: The Rôle of Calcium and Phosphorus.

WEDNESDAY.—(In the Eye Infirmary), Dr. A. J. Ballantyne and Dr. S. P. Meighan: Eye Cases.

Appointments

PARBURY, W. K., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer of Health for Kempston Urban District.

Births, Marriages, and Deaths

BIRTHS

GRAY.—On Jan. 12th, at Gloucester-row, Weymouth, the wife of George M. Gray, F.R.C.S., of a son.

WALKER.—On Jan. 14th, at Park-road West, Wolverhampton, the wife of Robert Milnes Walker, F.R.C.S., of a daughter.

WESTON.—On Jan. 7th, at Old Court, Ealing, the wife of Dr. Angus Weston, Greenford, of a son.

DEATHS

MACALISTER.—On Jan. 15th, at Barrmore, Cambridge, Sir Donald MacAlister, of Tarbert, Bt., K.C.B., in his 80th year.

RANDOLPH.—On Jan. 14th, at Milverton, Somerset, Charles Randolph, M.R.C.S., L.R.C.P., aged 83 years.

WILL.—On Jan. 12th, at Hill Cottage, Sawbridgeworth, John Kennedy Will, M.D., late of Bethnall House.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. II., 1933

THE Index and Title-page to Vol. II., 1933, which was completed with the issue of Dec. 30th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, London, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

NOTES, COMMENTS, AND ABSTRACTS

ADMISSION TO MUNICIPAL AND COUNTY HOSPITALS

By W. D. Bushell
BARRISTER-AT-LAW; FORMERLY ONE OF THE GENERAL INSPECTORS OF THE MINISTRY OF HEALTH

In framing a national hospital policy there is not much need for public discussion as to how the patients are to be treated after they have been admitted, but discussion is needed as to who is to have hospital treatment cheap or free at the public expense and who is to be refused that benefit. Now in the past there have been three methods of admission to the poor-law sick wards: (1) the normal and deliberate method, under which the order of admission is made by the guardians, or since 1929 the councillors, themselves at their weekly or fortnightly meeting; (2) the less deliberate method, under which the relieving officer gives the order for admission, commonly on the initiative of the patient's own doctor; (3) the urgent method, under which the chief executive officer of the institution, medical superintendent or master as the case may be, admits the patient on his own authority. Orders made under the second or third method are reported to the guardians at their next meeting for confirmation or criticism. It will be observed that in the case of an urgent order admission is obtained before any inquiries have been made as to the patient's financial position.

The Two Factors in Admission

Now no one is admitted to a public hospital, poor-law or voluntary, for medical reasons only, but always partly for medical reasons and partly on account of home environment and financial position. In the case of the surgical cases and of the acute sick the medical considerations generally predominate, but in the case of the chronic sick the financial position of the patient and his home environment are generally the more important. The councillors managing the hospital must necessarily rely on their medical adviser for advice on the medical aspect of the case, but in so far as their decision as to admitting the patient depends on his financial position and home environment they should rely on their own judgment after hearing the report of their non-medical investigator. It must be remembered that whereas in years gone by the sick in the poor-law sick wards often consisted almost entirely of the chronic sick, in more recent years and in those areas where the voluntary hospitals have not grown very rapidly the poor-law sick wards have been treating a great many surgical and acute patients as well as all the chronic sick. This fact has some bearing on the methods of admission.

Inquiries have always been made by the relieving officer as to the financial position of each patient in the poor-law sick wards, and these inquiries have been reported to the guardians, or now the councillors, in order that in suitable cases they may call upon the patient or his relatives to repay to the public part of the cost. Now the recovery of relief given on loan is never very easy. One difficulty with urgent admissions has always been that the inquiries and the assessment of the amount to be repaid cannot be made until after the benefit of hospital treatment has been enjoyed, and yet the readiness to pay is generally greater if the amount is fixed at the time of, or before, admission. Moreover, in the case of an urgent admission the preliminary inquiries are necessarily hasty except on the medical side, so that it may not be discovered that the patient is rich enough to pay for himself elsewhere than in a rate-supported hospital, and when such a case comes before the councillors it is too late to correct the mistake. The plan of granting assistance to tolerably well-to-do people and then asking for repayments graduated according to ability to pay has been adopted in many of the newer forms of public assistance such as mental deficiency, school meals, or tuberculosis. Very few statistics or reports have been published to show the success or otherwise of this system, but it would be imprudent to extend it rapidly and to accept the well-to-do readily into hospital on these terms, even if there were room for them, for the recovery of relief given on loan is not easy. The assisted persons who allow their repayments to fall into arrears in the hope that they may finally be written off are not always the poorest, and requests by constituents for help in getting these debts cancelled may put councillors in a very undesirable position. Moreover, it must be remembered that the highest charge made for treatment in these former poor-law sick wards is the average cost only, and that many patients cost more than the average. Also, of recent years there has been a tendency to allot the functions of ordering admission and of collecting repayments to quite different officials and to quite different departments of the town hall. This separation of function is not likely to facilitate the difficult business of collection.

Effect of "Appropriation"

The Local Government Act of 1929 has recommended to the local councils the formality of "appropriating" the former poor-law sick wards, that is to say, of formally dissociating them from the Poor Law Act and of associating them with the Public Health Act. This formality is in fact very inconvenient on the legal side, particularly in connexion with the law of settlement, and it is quite meaningless in the science of medicine. Its effect on administration is very obscure, but it has generally been taken to mean that the chief officer of the appropriated sick wards should take his orders from the medical officer of health instead of from the public assistance committee. There is, however, one result which certainly does follow from the formality of appropriation, that is, that the statutory poor-law orders no longer apply. These orders authoritatively required that inquiries should be made into the financial position of every patient and that the results of those inquiries should be recorded. Under the Public Health Act with which the sick wards are associated by the formality of appropriation there is no order at all regulating the admissions.

It is only in the County of London and in a few of the biggest of the eighty county boroughs that the local councils have adopted this formality of appropriation. No county other than London has adopted it. This difference is chiefly due to the fact that the poor-law sick wards in those big centres of population were already organised as separate infirmaries, that is to say, each set of sick wards of itself constituted an institution quite separate from the other, complementary, poor-law institution which provided for the merely aged and for the other non-sick indoor poor. The difference is also connected with the fact that it is particularly in these separate infirmaries in the biggest centres of population that the poor-law has of recent years come to treat so many surgical cases and acute sick in addition to the chronic sick.

Admission by Medical Superintendent

For many years past the urgent form of admission, by order of the medical superintendent, seems to have been growing more and more frequent in the poor-law separate infirmaries, although in some areas comparison with the past is difficult owing to the increasing number of street accidents which are necessarily admitted as urgent cases. There may have been a tendency to copy the practice of the voluntary hospitals, where the order of admission is generally made by some doctor on the medical staff of the hospital. It seems clear that in recent years, in the bigger centres of population, patients have been admitted who would formerly have been refused as being too well-to-do. But it is not clear whether this

naturally accompanies the admission of surgical and acute cases, or whether medical superintendents making these urgent orders, necessarily hastily, accept patients whom the councillors, more deliberately, would have regarded as too well-to-do. The tendencies to accept well-to-do patients in the poor-law sick wards and to accept more surgical cases and acute sick may be accelerated after the formality of appropriation, but it is a tendency which appeared long before the Act of 1929 was passed.

The hospital policy of the former poor-law sick wards, like that of the voluntary hospitals, was to admit poor people only. Also it was the rule of the poor-law to refuse those for whom accommodation was otherwise provided, so that while accepting all the chronic sick they habitually refused the surgical patients and the acute sick so far as the voluntary hospitals were willing and able to provide for them. In a circular letter of March 18th, 1910, the former Local Government Board expressed the opinion that an individual should be assisted at the expense of the poor rate if he was "unable to provide for himself the particular form of medical attendance or treatment of which he is in urgent need." But no further authoritative statement has been issued from Whitehall which defines in any detail the class of patient who is to be admitted to the poor-law sick wards. Now there is not much object in applying a mere formality like that of appropriation unless it is intended to be accompanied by some change of policy. But the Act of 1929 has not explicitly attached any new policy, or indeed any policy at all, to the formality of appropriation. Nor have those councils which have made appropriations avowed any new policy. Nor have estimates been published of the cost of extending the benefit of hospital treatment to new classes, nor of the cost of any other new policy.

In practice there is a tolerably well-established tradition in each area as to what social and medical classes of the population should be admitted to these former poor-law sick wards. This tradition is not broken by the formality of appropriation. And whatever extensions may be ultimately intended, any immediate development beyond the traditional limits is prevented by the fact that the buildings wherever suitable are already full. But tradition will fade, and cannot be relied upon permanently as an alternative to a considered policy.

Increasing Demand for Admission

Now the desire for admission to these hospitals is increasing. So long as the poor-law sick wards were accepting chronic patients only the danger of unnecessary applications to them was not very great, because for chronic patients residence in hospital is apt to be long and tedious and not very hopeful. Indeed, in the case of the lunatic asylums admission is never sought unnecessarily. But the former poor-law sick wards now do more and more surgical and acute work, and the new medical class thus being served is quite ready to welcome treatment in a hospital at which even the highest charge is much less than that at a private nursing-home. There are a very large number of possible patients of this latter class who might perhaps hope to recover a little more quickly in a hospital than in their own homes, but not so much so as to justify the very heavy expense to the public which their hospitalisation would involve. Also it would be idle to ignore the fact that the basis on which the panel doctor is paid is such as to incline him to pass on his patient to hospital as soon as he is ill.

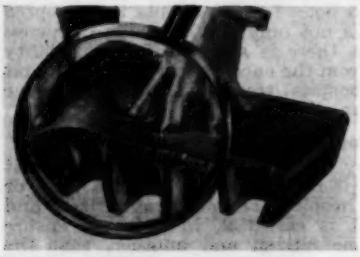
Irrespective of any avowed policy the effective hospital policy is the sum total of the daily admission orders. Now the normal duty of a medical superintendent is to care for the patients after their admission, and it is improbable that his position will be strengthened in the long run if he is made also the judge to select who is to be admitted. It is difficult to see how he would be able to protect himself if he were to be accused of preferentially admitting the patients of one particular doctor or the friends of certain councillors. Moreover, the function of accepting one and refusing another applicant is essentially a judicial function, and it is not on account of judicial qualifications that medical superintendents are appointed. And the first qualification for admission is that the applicant's income should be below a certain level, and this is not a matter on which medical men are especially qualified to decide. Further, the inclination of the medical superintendent will always lie in the direction of keeping the hospital full, or even overfull, because fullness suggests popularity and success. Also the refusal of an application may cause complaint, whereas the acceptance of it will but rarely do so. Yet if patients are accepted too readily there is not only the immediate expense to the public, but there is also the future liability which will follow from the encouragement of the habit of seeking cheap hospital treatment in order to save trouble and expense at home.

Decision Should be Made by a Tribunal

Now a voluntary hospital can within limits admit whatever patients it may wish, but when a rate- or State-maintained hospital accepts one citizen and refuses another, it is essential, in order to ensure justice between one citizen and another, that the decisions should be made by some tribunal of a semi-judicial character. Incidentally it may be observed that the relief committee of the public assistance committee, on account of its records being prescribed by authority and on account of the semi-independent position of the relieving officer, was a better judicial body than any subcommittee of the public health committee. It is undesirable that the councillors should delegate the function of deciding on applications for admission to the medical superintendent and to the medical officers of health. In the first place the councillors are unwise to abandon a position which enables them to insist that enough beds should be reserved for the chronic aged sick for whom the hospitals were as a rule originally built, because the chronic sick are of so little professional interest that the inclination of a zealous medical and nursing staff is always likely to be in the direction of filling up the available beds with surgical and acute cases. Also it is the councillors themselves who order the admissions into the other institution, the poor-law institution for persons who are not sick, and these poor-law infirm wards are likely to be quite adequate for the needs of many who apply for admission to the sick wards. Unless the councillors themselves watch and control the admissions very closely they will presently awake to find that what is practically a new hospital policy has become established, and that policy will be one of admitting additional social and medical classes, and the cause of the council's awakening will be a demand for an additional hospital, and hospitals are very expensive. By the time the demand is made it will have become very difficult to resist, and the councillors will find that their hands have been forced, because the daily opening up of the hospital to ever widening social and medical classes will have by that time manufactured a public expectation that all of these classes are entitled to hospital treatment at the public expense whenever they wish for it. Undoubtedly there are a certain number of admissions which are urgent, and which must therefore be decided by the medical superintendent or some other official, but many applications from the chronic sick are not urgent, and the fact that the voluntary hospitals have waiting-lists shows that many surgical and acute cases can await a managers' weekly meeting. If the councillors are to keep any hold on the direction of hospital policy they need to insist that all applications for admission should be referred to them personally, and that before and not after admission, unless the application is quite explicitly certified to be an urgent one. At present, especially in those areas in which appropriations have been effected, the councillors show signs of permitting themselves to be pushed into a position where they may be obliged to build additional hospitals in order to meet needs for which they need hardly have made themselves responsible.

A MATTRESS OF RUBBER LATEX

THE ideal mattress, which combines comfort with hygienic qualities and never requires to be remade, appears at last to have been produced. The mattress does not sag, need not be turned daily or indeed ever, and can be washed in soap and water and dried in an air current. It is made of rubber latex—the untreated juice of the rubber tree—in such a way that it has an apparently smooth upper surface and yet is pervious to air and to water.



The under-surface is made up of arches, extending through more than three-quarters of the depth of the mattress, so that the resilience of the rubber itself is still further enhanced by the honeycomb pattern of its construction. The manufacturers (the Dunlop Rubber Co.) describe the Dunlopillo as a "cellular air cushion mattress," and this implies no exaggeration, for it appears to combine the virtues of an air cushion with those of a hair mattress. It seems probable that if the mattress proves to be durable and if the price can be reduced—the cost of a 6 ft. by 3 ft. by 4 in. mattress, with twill cover, is now £6 6s.—mattresses of this type will come into general household use. Meanwhile, if the initial outlay can be faced, they should certainly be considered when hospital mattresses are replaced or new hospitals are being equipped. The saving of labour and of cost of upkeep should well repay the increase in capital expenditure. The same material is used for rubber cushions and rings of various sizes and shapes.

NON-GONORRHŒAL INFECTIONS FOLLOWING GONORRHŒA

THERE is still disagreement about the mechanism and incidence of generalised infections following the secondary infections of gonorrhœa. Useful inquiries on this subject are being made at the skin department of the Rikshospital in Oslo by Prof. E. Bruusgaard, and in conjunction with Dr. N. Danbolt he has published (Nord. Med. Tidskr., 1933, Nr. 30) a detailed study of three cases. In all of these chronic gonorrhœa with prostatitis was followed by a secondary infection and this again by a generalised infection. The clinical picture was dominated by the secondary, pyæmic infection; blood culture yielded yellow hæmolytic staphylococci in two cases and hæmolytic streptococci in the third. In the first two there were multiple abscesses in the skin, subcutaneous tissues, bones, and joints, and in one of them the illness was rapidly fatal. The second patient recovered, but only after a prolonged illness and the loss of one limb by amputation. The third also recovered in spite of a prolonged subfebrile period which entailed many months of invalidism. In this case a prostatic abscess yielded streptococci which presumably reached the blood stream by way of the lymphatic system.

PLANTS AND HUMAN WELFARE.—Mr. Ronald Good writes: "May I be allowed to correct a somewhat serious misunderstanding in the review of my book 'Plants and Human Economics' which appeared in your issue of Jan. 6th? The writer of the notice is apparently under the impression that the book has been written for examination purposes. That this is not the case is, I think, made clear in the preface. In fact the reason for the book was the opposite, namely, to provide a small handbook to an aspect of botany which, since it is not a common subject of examination, has been hitherto much neglected. I should be sorry if 'Plants and Human Economics' was looked upon as being 'examinational in aim.'"

Vacancies

For further information refer to the advertisement columns

Accrington, Victoria Hospital.—H.S. £150.
Barnsley, Beckett Hospital and Dispensary.—H.P. £200.
Benenden, Kent National Sanatorium.—Res. Asst. M.O. £325.
Bethnal Green Hospital, Cambridge-road, E.—Asst. M.O. £350.
Birkenhead Infirmary.—Res M.O. £300.
Bradford Royal Infirmary.—Two H.S.'s. Each at rate of £135.
Cardiff Royal Infirmary.—Two H.S.'s. One Gynæcological H.S. Each at rate of £50. Also Ophthalmic H.S. At rate of £40.
Carshalton, Surrey, Queen Mary's Hospital for Children.—H.P. At rate of £80.
Coventry and Warwickshire Hospital.—Res. H.S. £125.
Durham County Mental Hospital.—Asst. M.O. £350.
Eastbourne, Princess Alice Memorial Hospital.—Res. H.S. £150.
East Ham Memorial Hospital, Shrewsbury-road, E.—Two Anæsthetists. Each 1 gn. per session.
Elizabeth Garrett Anderson Hospital, 144, Euston-road, N.W.—Hon. Asst. Physician; also Physician to Skin Dept.
Evelina Hospital for Sick Children, Southwark, S.E.—H.P. At rate of £120.
Glasgow University.—Harry Stewart Hutchison Prize. £50.
Gloucestershire Education Committee.—School Medical Inspector. £500.
Guildford, Royal Surrey County Hospital.—Hon. Dermatologist.
Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—H.P. At rate of £100.
Hastings, Royal East Sussex Hospital.—Sen. and Jun. H.S.'s. At rate of £200 and £150 respectively.
Hull, City Hospital for Infectious Diseases, Cottingham.—Res M.O. £350.
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150.
Leeds University, Dept. of Physiology.—Lecturer in Physiology. £400–£500.
Liverpool Open Air Hospital for Children, Leasowe.—Two Hon. Asst. Orthopædic Surgeons.
London Jewish Hospital, Stepney Green, E.—M.O. for Actino- and Physio-Therapeutic Dept. £100.
Manchester, Northern Hospital for Women and Children.—Jun H.S. £100.
Manchester, St. John's Hospital.—Hon. Surgeon.
Miller General Hospital, Greenwich-road, S.E.—Res. Surg. O. and Reg. £250.
Newcastle General Hospital.—Two H.P.'s and H.S. Each at rate of £150.
Nottingham General Hospital.—Res. Cas. O. and H.S. At rate of £200 and £150 respectively.
Poplar Hospital for Accidents, East India Dock-road, E.—Second Res. O. £175.
Preston, Biddulph Grange Orthopædic Hospital.—Jun. H.S. At rate of £150.
Prince of Wales's General Hospital, N.—M.O. for V.D. Clinic. £400.
Putney Hospital, Lower Common, S.W.—Hon. Consulting Anæsthetist.
Queen's Hospital for Children, Hackney-road, E.—H.S. and Cas. O. Each at rate of £100.
Queen Mary's Hospital for the East End, Stratford, E.—Hon. Dental Surgeon.
Rowley Regis Borough.—M.O.H. and School M.O. £800.
Royal Masonic Hospital Ravenscourt Park, W.—H.P., Surgeons, &c.
Royal National Orthopædic Hospital, 234, Gt. Portland-street, W. Locum H.S. At rate of £150.
St. Bartholomew's Hospital, E.C.—Chief Asst. for Consultative Neurological Clinic.
St. Giles' Hospital, Brunswick-square, S.E.—Clin. Asst. At rate of £100.
St. Helens County Borough.—Deputy M.O.H. £700.
St. James' Hospital, Ouseley-road, Balham, S.W.—Temp. Asst. M.O. At rate of £250.
St. Stephen's Hospital, Fulham-road, S.W.—Clin. Asst. At rate of £100.
Salford, Hope Hospital.—Asst. Res. M.O. At rate of £200.
Salisbury, General Infirmary.—H.S., H.P., and Cas. O. Each at rate of £125.
Sheffield Children's Hospital.—H.P. At rate of £100.
Southend-on-Sea General Hospital.—Res. Obstet. and Gynæc. Officer. Also First H.S. At rate of £125 and £100 respectively.
University College Hospital, Gower-street, W.C.—Reg. in Radium Dept. £400.
Warrington Infirmary and Dispensary.—H.S. £150.
Western Ophthalmic Hospital, Marylebone-road.—Sen. and Jun. Res. H.S.'s. At rate of £150 and £100 respectively.
Willesden Corporation.—Asst. M.O. £600.
Wolverhampton Royal Hospital.—H.S. to Ear, Nose and Throat Dept. At rate of £100.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons at Ludlow, Salop; Wigan, Lancaster; Sheerness, Kent; Chagford, Devon; Polesworth, Warwick; Whitchurch, Salop; Peebles, Peebles; and Cupar, Fife.